

CAN SUSTAINABLE DEVELOPMENT BE  
FACILITATED THROUGH REGIME-BASED  
PREVENTATIVE TECHNOLOGY TRANSFER?

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## ABSTRACT

This International Relations study examines the relationship between sustainable development and preventative technology transfer. Specifically, the focus is on whether preventative environmental regimes (facilitating organisations) are significant in sustainable development. In contrast to other studies, the question is considered whether a regime's facilitation mode provides stakeholders additional capacity to deal with the complexities of preventative technology transfer. A regime's facilitation mode may enhance stakeholder co-operation in a way that is conducive to sustainable development. Additionally, the question is deliberated whether equilibrium in the facilitation mode permits a regime to modify collective behaviour for improved sustainable development results. Using communication theoretical analysis in a comparative case study of two preventative technology transfer regimes for the period 1998-2004, evidence is found of an association between regime facilitation mode and sustainable development outcomes. Indeed, the comparative case evidence indicates that regime facilitation mode outdoes regime sphere and composition. Moreover, it is suggested that equilibrium in the facilitation mode may be a decisive factor in the significance of a regime.

## DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

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In a discussion about inter-/disciplinary research in communication, Kenneth Boulding once remarked: “The spread of specialized deafness means that someone who ought to know something that someone else knows isn’t able to find it out for lack of generalized ears” (Boulding, K., 1968: 4). Most major efforts are helped along by fortunate combinations of supportive factors. I would like to express my gratitude in particular to the following for helping my ‘generalized ears’ effort to become a major one.

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Jorg D. Valentin, B.A. (Hons), M.E.S.

## LIST OF ABBREVIATIONS

ABC	Australian Broadcasting Corporation
CCIWA	Chamber of Commerce and Industry Western Australia
CECP	Centre of Excellence in Cleaner Production
CP	Cleaner Production
CPC	Cleaner Production Centre
CPS	Cleaner Production Statement
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSR	Corporate Social Responsibility
EPA	Environmental Protection Agency
GEF	Global Environment Facility
GHG	Greenhouse gas
IDCP	International Declaration on Cleaner Production
IR	International Relations
ISO	International Organisation for Standardisation
ISR	Australian Federal Department of Industry, Science and Resources
LCA	Life Cycle Assessment/Analysis
NCPC	National Cleaner Production Centre
OECD	Organisation for Economic Cooperation and Development
PC	Pollution Control
SANet	Sustainable Alternative Network
SETAC	Society of Environmental Toxicology and Chemistry
SRRP	Synthetic Rutile Recovery Plant
UN	United Nations Organization
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
WACPS	Western Australian Cleaner Production Statement
WA SIG	Western Australian Sustainable Industry Group
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WMC	Western Mining Corporation

# **1 INTRODUCTION**

Towards the end of the twentieth century, scientific observations were providing considerable evidence that human induced environmental change had been occurring around the globe. Manufacturing, for example, had been identified as a major source of air, land, and water pollution contributing to environmental degradation. Relevant figures published as early as 1991 showed that in the developed economies of countries of the Organisation for Economic Cooperation and Development (OECD), manufacturing accounted for twenty-five per cent of nitrogen oxide emissions, forty per cent of sulphur oxide emissions, sixty per cent of water pollution, seventy-five per cent of non-hazardous inert waste, ninety per cent of toxic substances discharged to water and almost all potentially hazardous releases and wastes (OECD, 1991: 1 seq). But more importantly, projections for the developing economies of non-OECD countries, such as China and India, showed that the expected manufacturing value-added was to triple by 2010 (UNIDO, 1991: 1 seq). Faced with such a state of affairs, it is small wonder perhaps that the international community was looking for ways to reduce the environmental impact of the advance of industrialisation and the associated growth.

## **1.1 Sustainable Development**

In 1992, the high-level meeting of the United Nations Conference on Environment and Development (UNCED), or Earth Summit, as it is more commonly known, was to provide a forum for an international exchange of ideas about political and management action in sustainable development. It is probably fair to say that the 1992 UNCED in a sense constituted the advent of international environmental diplomacy, acknowledging the notion that human activities could transform the

environment at continental and even planetary levels. As a result of forum deliberations at the Earth Summit, the *Rio Declaration on Environment and Development* and *Agenda 21* were signed by 110 heads of government. This act represented formal recognition of humanity's conscious engagement in an effort to manage its interactions with the global environment.

One of the scenarios at the heart of deliberations at the Earth Summit was that ecological and demographic disasters touched off by the spread of industry in the developing world could spread 'chaos' as millions of refugees from the 'southern' half of the world invade the 'wealthy' lands of the 'north'. A factor that appears to have fanned this scenario is climate change and the impact of human activities on Earth's climate. One response to this predicament was to bring in 'sustainable development' - a contested concept. Assuming something of a 'piggy-in-the-middle' role between economic rationalists and radical environmentalists, sustainable development essentially is a multi-stakeholder process endeavouring to reconcile the values of both of the competing poles (Doyle, T. & McEachern, D., 2001: 34-35). Despite the criticisms from both opposing sustainability camps, sustainable development, since its acclaimed inception in the 1987 Brundtland Report (UNO, 1987) of the World Commission on Environment and Development (WCED), remained at the core of calls from state and non-state actors alike across the globe (Dryzek, J. S., 2005: 145-161). Moreover, the 1992 United Nations Conference on Environment and Development (UNCED) accentuated the importance of sustainable manufacturing to move beyond Pollution Control towards preventative approaches that minimise waste energy and materials, such as Cleaner Production.

The consideration that human activities could transform the environment was at the heart of the substance and goals of the Earth Summit. The country members of



the UNCED met in Rio de Janeiro in June 1992 to seek international agreement on ways to achieve the cause of global sustainable development. The resulting international agreement that the Conference formulated and adopted in the *Rio Declaration* and *Agenda 21* saw the incorporation of the idea of preventative policy and management action in sustainable development. It was this notion of ‘prevention rather than cure’ that was taken on board in the *Rio Declaration* which established a set of fundamental principles for global sustainable development. Among other things, the *Rio Declaration* encourages ‘... States to reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies’ (UNCED, 1992: Principle 8). It also endorses ‘... the creation of new levels of cooperation among States, key sectors of societies and people’ (UNCED, 1992: Preamble). Likewise, the idea of ‘prevention rather than cure’ was written into *Agenda 21* which details the action required for global sustainable development. Among other things, *Agenda 21* espouses the transfer of environmentally sound technologies which ‘... protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes’ (UNCED, 1992: Chapter 34, Section 1). With this, the Earth Summit had set the tone for preventative policy and management action in sustainable development.

Fourteen years on, and only a couple of years after the conclusion of the thesis research period, this tone could still be heard reverberating, with state and non-state actors calling for increased international co-operation in achieving sustainable development worldwide through greater use of environmentally sound technology. One instance of this was the World Bank’s call which came against the background of the findings of the World Bank’s 2006 Report on Clean Energy and Development, underscoring the need for accomplishing sustainable

development by preventative means. In the Report, the World Bank and the International Monetary Fund emphasised the necessity for the global community to work towards meeting the energy requirements crucial for economic growth and reducing poverty, while, at the same time, leaving a smaller environmental footprint. More specifically, the report explained:

The widespread commercialization of energy efficiency technologies is an effective strategy to both reduce local and regional air pollutants and address climate change without affecting economic growth as well as addressing energy security concerns. ... Unfortunately, carbon intensive energy infrastructure and inefficient cities are being rapidly built and expanded, setting the capital stock for decades while new, cleaner, and more efficient technologies remain underutilized. (World Bank, I. M. F., 2006)

Similarly, and closer to home, a different example of a call for a greater push in the promotion of the transfer of energy-saving technology throughout the world at the time was that of the former Australian Federal Environment Minister, Senator Ian Campbell. After returning from an international climate change meeting in Zürich, Switzerland, the Environment Minister expressed his dissatisfaction with the lack of action to ensure the spread of environmental breakthroughs, saying:

Let's identify the barriers and challenges that stand in the way of technology transfer, say for a light bulb, but also for carbon sequestration storage or a range of other technologies, then work together as a group of ministers to identify those barriers. (ABCNewsOnline, 2006)

## **1.2 Pollution Prevention Regimes**

Considering that since the 1992 Earth Summit the calls for preventative sustainable development emitted by state and non-state actors alike appear not to be subsiding, one is tempted to ask whether time has stood still. Is one to take these calls simply as testimony of the international community's resolve to sit out the widely agreed need for reducing the environmental impact of the advance of industrialisation and the associated growth? Perhaps not. Seeing that since the Earth Summit, a number of sustainability regimes (facilitating organisations) had

been established worldwide with the aim of assisting in the implementation of the 1992 UNCED principles and actions. However, it needs to be pointed out that only a handful of preventative sustainable development regimes existed in the first five years of the new millennium. Among these, the global International Declaration on Cleaner Production (IDCP) and the regional Cleaner Production Statement (CPS), instituted by the United Nations Environment Program (UNEP) in 1998 and the Western Australia Sustainable Industry Group (WA SIG) in 1999 respectively, were of particular interest. UNEP's IDCP and WA SIG's CPS were unusual in that they shared a multifaceted institutional make-up with multifarious stakeholders co-operating in preventative sustainable development.

To get an inkling of the complexity of UNEP's IDCP and WA SIG's CPS, a brief look at the organisational structure of these preventative environmental regimes is in order. At the time of research, a total of five hundred and twenty-nine actors world-wide had signed up to the IDCP (UNEP, 2005). With signatories from Asia, Africa, North America, South America, Europe, and Australia, the IDCP was home to eighty-nine governments, two hundred and twenty companies, and two hundred and twenty facilitating organisations. Similarly, there were a total of one hundred and three actors in Western Australia who had signed up to the CPS (WASIG, 2005). The CPS was home to forty-one governments at state or local level, twenty-eight companies, and thirty-four facilitating organisations from across Western Australia. With such a heterogeneous institutional make-up, multi-stakeholder co-operation in preventative technology transfer is not a matter of course. Rather, it needs to be facilitated by regime-based policy action, which can give form to regime composition, if a decline in the environmental imprint of current and future industrialisation is to be feasible.

In order to answer the thesis question of whether sustainable development can be facilitated through regime-based preventative technology transfer, this study explores which factors best explain UNEP's IDCP and WA SIG's CPS policy and management action for the facilitation of preventative technology transfer. From a look at the literature, it appears that regime-based facilitation of preventative technology transfer has not yet been problematised in International Relations research. However, in the specialised International Relations field of Regime Theory, relevant scholarly literature has been produced on the associated question of co-operation. Studies on this topic attempt to explain the standing or significance of a regime in the international system by offering assumptions about the nature and motivations of actors in regime formation.

### **1.3 Regime Significance and Co-operation**

In the International Relations literature, the significance of a regime is measured statically in terms of the regime's effectiveness at any given point in time (Underdal, A., 1992: 227-240) as well as dynamically in terms of the regime's resilience in the face of change (Powell, R., 1994: 340 seq). Depending on the suppositions made about an actor's character and intent to co-operate, the literature attributes different degrees of significance to regimes. One group of scholars has addressed the influence of an actor's interests on regime co-operation. This literature depicts actors as rational egoists whose only concern is for their own absolute gains. Regimes are described as assisting self-interested actors in realising common interests. Because they help actors to co-ordinate their behaviour so as to prevent collectively sub-optimal results, regimes are seen to be both effective and resilient. Using contemporary economic theories of institutions, some studies have examined the effects of regimes on the capacity of actors to

co-operate in situations close to the Prisoner's Dilemma (Keohane, R. O., 1984: 68). Such research develops a functional argument to account for the creation and maintenance of regimes. Other studies have sought to broaden the functional perspective by considering the full gamut of strategic situations in which actors might co-operate through regimes (Martin, L. L., 1993: 91-121; Oye, K. A., 1986: 1-24; Snidal, D., 1985: 923-942, 1986: 25-57; Stein, A. A., 1983: 115-140; Zürn, M., 1992, 1993: 63-84). Such enquiry explores the implications of diverse constellations of interests for the probability of regime formation. Another set of studies deem the nature of issues to be an important instance affecting the possibility and the smoothness of regime formation in given conflict situations (Efinger, M., Mayer, P. & Schwarzer, G., 1993: 252-282). In response to these perspectives, studies developed which attempted to deal with penchants that give structure precedence over process (Young, O. R., 1989, 1991: 281-308). Such analysis repudiates the stance that actors are always fully aware of their interests and that preference creation is a process that precedes and is exogenous to multi-party bargaining.

Another group of scholars has concentrated on the impact of an actor's power on regime co-operation. This literature presumes that actors care not only for absolute, but for relative gains as well. Here, relative power capabilities are accentuated and an actor's sensitivity to distributional facets of co-operation and regimes is underscored. Because actors care for how well their competitors do out of concern for their own survival and independence, this literature argues that co-operation is both not easily instituted and likely to come undone as a consequence of changes in the distribution of power assets or of sudden distributional effects of regimes. The existence of effective and resilient regimes is therefore linked to a uni-polar constellation of power in the issue-area in question (Kindleberger, C. P., 1973: 305). This literature has developed mainly as

a response to the interest-oriented theories of regimes which rely heavily on the standard game-theoretical 2x2 Prisoner's Dilemma representation of the co-operation problem faced by actors. Prisoner's Dilemma is dismissed on the basis that it exhibits a single co-operative solution, which appears to be equally appreciated by both actors, thereby eclipsing the distributional controversies that trouble the real-world co-operative endeavour. Where scholars in this mould differ is in the specific role that they ascribe to power within their respective account, which also has major implications for their predictions about regime content. Thus, some studies contemplate power as a means of statecraft, analysing the marked distributional biases in favour of the most powerful actors in the issue-area (Krasner, S. D., 1991: 336-366, 1993: 139-167). Other studies deliberate on power as an aim of foreign policy, purporting that regimes tend to display a balanced distribution of gains from co-operation or otherwise disintegrate (Grieco, J. M., 1988: 485-507, 1988: 600-624).

Last but not least, a third group of scholars has focused on the effect of an actor's knowledge on regime co-operation. This literature is a critical response to both the interest- and power-oriented notion of rational actors, whose identities, powers, and primary concerns are prior to society and its institutions. Interest-oriented theories are criticised for presenting a partial representation of the sources of regime resilience by failing to take enough account of the ramifications of institutionalised practices for the identities of actors. This literature contends that by black-boxing the processes which produce the self-understandings of actors as well as the goals which they pursue, a major source of difference in behaviour and outcomes is disregarded. It is argued that these processes are moulded by the normative and causal beliefs that decision-makers hold, and that alterations in belief systems can generate modifications in policy (Schaber, T. & Ulbert, C., 1994: 139-169). Contending

that actors are better understood as role-players than as utility-maximizers, this literature is much more confirmatory about the effectiveness and resilience of regimes than are interest- and power-oriented theories. Subject to how fundamental a review of utility-focused literature they deem crucial, role-focused theorists either concentrate on the sources and dynamics of rational actors' perceptions of the world or investigate the sources and dynamics of social actors' self-perceptions in the world. Studies on rational actors' perceptions (Adler, E. & Haas, P. M., 1992: 367-390) conceptualise utility as depending on knowledge, which cannot be reduced to material structures. Judging causal and normative convictions to be somewhat distinct from actors' power and wealth, these studies maintain that the need for regimes depends on actors' perceptions of problems, which is, to a degree, shaped by their causal and normative convictions, which, in turn, makes both the sources of these convictions and the workings of their influence on actors' decision-making interesting objects of investigation. Studies on social actors' self-perceptions (Kratochwil, F. V. & Ruggie, J. G., 1986: 753-775) problematise the existence and character of actors as competent players, focusing on the shared conceptions that mould the role identities of actors, that is, their underlying self-perceptions in relation to others. These studies contend that actors do not merely possess a certain accumulation of knowledge which affects their choices in specific situations, but that they are actors, and actors of a specific kind, only by dint of a shared knowledge which covers their relations as a social space. Asserting that knowledge, in fact, creates actors and allows them to associate in co-operation, these studies maintain that regimes are necessary pre-conditions for, rather than consequences of, power- and interest-oriented choices.

## 1.4 Regime Significance and Communication

Theories of co-operation are useful in accounting for the nature and motivations of actors in regime formation. However, as Kütting points out:

It is not sufficient to try to explain the behaviour of actors and their motivations if this does not lead to analysis of how international problems can be dealt with more effectively. This is true of social problems but becomes paramount in relation to environmental degradation. (Kütting, G., 2000: 140)

Indeed, studies of co-operation have a propensity to explain regime significance by reference to the existence of, the possible high participation in, or the ultimate compliance with, a particular regime agreement. In studies of co-operation, regime performance is not generally measured by regime facilitation, a variable which may clarify how specific matters nominally addressed by that regime are dealt with. This thesis examines this variable, the focus being on regime communication and its relationship to the concept of regime significance, including regime effectiveness and regime resilience. Hence, in order to answer the thesis question of whether sustainable development can be facilitated through regime-based preventative technology transfer, this study explores which communicational factors best explain UNEP's IDCP and WA SIG's CPS policy action for achieving collective decisions and behaviour in preventative technology transfer.

In this introduction, the general background to the topic was provided, together with a brief history, as well as a literature review describing the relevant scholarly literature and an explanation of how the research fits within the International Relations (IR) literature. In the following, the methodology describes the research format, including the choice of cases, the description and operationalisation of the dependent and independent variables, and the choice of sources and analytical methods. In the case presentation, the variables and the context are set out. This comprises a discussion of the evidence, the strength of relationships, and a



response to the research question. The conclusion discusses the importance of the research findings. These are linked back to other similar studies. As indicated in the Introduction, the understanding of regimes of preventative technology transfer has limitations and further studies are necessary. A brief discussion is given about the research limitations and what type of studies would further enhance the understanding of the topic. In addition, a synopsis of the project is given. This includes the research question, the importance of studying this question, the variables addressed in the thesis, and the conclusions reached from the evidence collected.

## **2 RESEARCH METHODOLOGY**

This thesis inquires as to whether sustainable development can be facilitated through regime-based preventative technology transfer. Sustainable development was chosen for exploration, rather than the opposing environmentalist and economic poles of sustainability, because in the research period global sustainable development was generally regarded as the best way to neutralise the inadvertent by-products of widely supported economic activities. Preventative technology transfer was selected, as opposed to the predominant distribution of control technology, because preventative policy and management action in sustainable development as formulated in UNCED's Rio Declaration and Agenda 21 was commonly seen as a forward-looking way to achieve sustainable development worldwide.

### **2.1 Regime Significance and Regime Facilitation**

This study's dependent variable is UNEP's IDCP and WA SIG's CPS facilitation of preventative technology transfer. For the purposes of this study, this is defined as UNEP's IDCP and WA SIG's CPS policy action for achieving collective decisions and behaviour in preventative technology transfer. Facilitation was specified in this manner because it provides insight into how specific multi-stakeholder co-operation matters nominally addressed by these regimes are dealt with. This definition of facilitation also assists in addressing the concept of regime significance which is measured by regime effectiveness and regime resilience. For regime effectiveness, the extent to which UNEP's IDCP and WA SIG's CPS enhance the ability of stakeholders to co-operate in preventative technology transfer was explored. For regime resilience, the extent to which collective decisions and behaviour in later periods of UNEP's IDCP and WA

SIG's CPS history of preventative technology transfer are constrained was investigated.

Elucidating regime significance in terms of regime effectiveness and regime resilience essentially necessitated the adoption of an institutional approach (Koelbe, T. A., 1995: 231–243) establishing causal pathways in the framing of UNEP's IDCP and WA SIG's CPS sustainability facilitation. The focus of this approach is on the ways and the conditions under which the prevention regimes effect sustainability facilitation policy making and management. Of interest here are the ways in which relatively stable rules, procedures, and operating practices constitute the interactions among stakeholders. The primary reason for seeking to document evidence of such constellations is that institutional make-up can have an effect on the distribution of power among actors and actors' perceptions of their own interests and thus the ideas that form issue evolution (Haas, P. M., Keohane, R. O. & Levy, M. A., 1993: 3-24; Keohane, R. O. & Levy, M. A., 1996). In order to gauge issue development and the regime factors and processes moulding it (Brooks, H., 1977: 243; Haas, P. M. & Haas, E. B., 1995: 255–285; Lee, K. N., 1993; Sabatier, P. A., 1999: 117–166), this thesis also looked at the potential complementary role of institutional learning (Argyris, C. & Schon, D., 1978). Of interest here was the ways in which the prevention regimes' development of issues in sustainability facilitation and related hazards or opportunities of sustainability facilitation can usefully be understood as a sustained institutional learning process. The chief rationale behind seeking to view the development of sustainability facilitation issues through a learning lens is to ascertain key regime processes and relationships in sustainability facilitation policy making and management that may complement other equally partial explanations (Sabatier, P. A., 1999; Sabatier, P. A. & Jenkins-Smith, H. C., 1993).

Exploring UNEP's IDCP and WA SIG's CPS facilitation of preventative technology transfer in terms of the institutional impact and interactions of ideas and interests thus required shedding light on change and dynamics. Institutions, interests, and ideas, as concentrated on in this project, can all be observed from a dynamic perspective, with particular attention paid to the ways in which they induce change in one another. The need for attention to the role of learning as an driving force of change is emphasized by the knowledge intensive, dispersed character of the formulation and execution of the regimes' multi-stakeholder co-operation matters. In order to understand how discoveries, experience, and innovations active in one part of the facilitation policy making and management system extend to another, this thesis investigated processes involving lesson drawing from institutional experience with one sustainability facilitation issue to enlighten institutional policy making and management of another. Specifically, this project trailed some of the most important processes and conduits through which the impact of ideas and interests in institutional facilitation policy action took place. This includes communication channels through which the regimes receive and dispatch ideas about the management of sustainability facilitation issues, or the channels through which the regimes come to perceive themselves as interested parties in the development of some sustainability facilitation hazards but not others.

The purpose thus was to identify the ways in which the regimes used specific courses of policy action to promote change in concern and capacity that affect sustainability outcomes. In terms of institutional learning, the role of ideas in the development of sustainability facilitation issues was of particular importance in the empirical studies of this thesis. There are two main reasons for this. Images and frames can be important for defining what knowledge has a bearing and who feels concern (Hajer, M. A., 1995; Schon, D. A. & Rein, M., 1994) as can joint

beliefs in steadying coalitions of stakeholders (Goldstein, J. & Keohane, R. O., 1993; Haas, E., 1990: 2-6). This thesis therefore sought to gain insight into the way dominant images and joint beliefs (Goldstein, J. & Keohane, R. O., 1993; Haas, E., 1990: 2-6) provided the motive force behind regime policy dynamics. In this connexion, the question of who pushes ideas in the development of sustainability facilitation issues was central to the interests of this thesis. It is stakeholders that are at the heart of the innovation, selection, and diffusion of ideas in policy action. And it is stakeholders who provide the energy that moves and motivates change in policy making and management by inputting ideas to the problem definitions and policy proposals that eventually are adopted by regimes, thus affecting interests in various ways. This project therefore sought to document the influence and activities of both the traditional state and non-state actors and of issue networks (Keck, M. E. & Sikkink, K., 1998), advocacy coalitions (Sabatier, P. A. & Jenkins-Smith, H. C., 1993), or epistemic communities (Haas, E., 1990: 2-6), active on the stage of sustainability policy making and management as well as the particular directions promoted in the regimes' development of sustainability facilitation issues.

Three aspects of institutional learning were especially relevant in this study. First, the question of which actors learn which lessons in order to ascertain the likelihood of learning inside, and perhaps by, the regimes, but also to determine who is striving to advance lessons about the management of sustainability facilitation issues, and who is trying to learn them. Second, the question of what kind of lessons are being learned in order to get a sense of the way in which institutional learning in the management of sustainability facilitation issues involves changes in higher order concepts, including norms, etc. (Hall, P., 1993: 275–296; Jachtenfuchs, M. & Huber, M., 1993). By going beyond the notion of learning as being the incorporation of new knowledge or experience into existing

practices, causal models, and decision making procedures, this study comprehends learning as a process that may help to bring about cognitive changes at multiple levels ranging from issue frames and basic beliefs (Haas, E., 1990: 2-6; Haas, P. M. & Haas, E. B., 1995: 255–285; Hall, P., 1993: 275–296; Keohane, R. O. & Nye, J. S., 1977: 64 seq; Sabatier, P. A., 1988: 129–168) to more elemental concepts, including cause-and-effect relationships, appraisal of the efficacy of particular management interventions, and basic skills of management practice. Third, there is the question of how lessons are taken on board in order to establish the regimes' increasing ability to cope with the world, that is, the regimes' increasing ability to incorporate experience for the purpose of attaining or revising policy and management objectives which may lead to superior sustainability outcomes. However, given experience may not be the only source of cognitive change, learning in this project encompasses experience and fresh information (Hall, P., 1993: 275–296; Keohane, R. O. & Nye, J. S., 1977: 64 seq). Furthermore, in view of this study's interest in the making and management of sustainability facilitation policy, this thesis looked at management objectives as well as the more restrictive policy objectives. In this project, learning therefore incorporates those processes that deliberately utilise experience or information to bring about cognitive changes in relation to the management of sustainability facilitation issues. Questions regarding the instrumental effectiveness or normative repercussions of institutional learning are left to be treated empirically.

Applying an institutional learning approach of the type outlined above in a bid to clarify regime significance to all intents and purposes called for the adoption of a broader view on UNEP's IDCP and WA SIG's CPS sustainability facilitation policy making and management and the treatment of the topic in a more comprehensive manner. A variety of relevant (sub-) disciplines contributing to International Relations was therefore deliberated on before generating

axiomatically a combination of standard (sub-) disciplinary methods and techniques of analysis. As a result, a multi-disciplinary methodology was applied which allowed a static or ‘point-in-time’ analysis as well as a dynamic or ‘over-time’ analysis encompassing three phases. In a first research phase, Koelbe (Koelbe, T. A., 1995: 231–243) and Krasner (Krasner, S. D., 1983: 2) were used in terms of what is labelled the regimes’ *issue-actor compass* to explore the elemental to higher order concepts in the collective sustainability facilitation mindset and outlook of UNEP’s IDCP and WA SIG’s CPS. In a second research phase, Downs (Downs, A., 1972: 38–50), Kingdon (Kingdon, J. W., 1984), Jachtenfuchs & Huber (Jachtenfuchs, M. & Huber, M., 1993), Rochefort & Cobb (Rochefort, D. A. & Cobb, R. W., 1994), Hajer (Hajer, M. A., 1995), and Sabatier (Sabatier, P. A., 1999) were employed to investigate what is dubbed the regimes’ *issue agenda* as well as *actor agenda* in terms of the ways in which UNEP’s IDCP and WA SIG’s CPS recognised sustainability issues and the manner in which the regimes developed new partnership initiatives to engage stakeholders in the management of these sustainability issues. Whilst the first and second phase of the multi-disciplinary methodology allowed a *static* analysis for ascertaining regime effectiveness, a third research phase was implemented which permitted a *dynamic* analysis for revealing regime resilience. Here, Jones (Jones, C. O., 1984), Norberg-Bohm et al. (Norberg-Bohm, V., Clark, W. C., Bakshi, B., Berkenkamp, J., Bishko, S. A., Koehler, M. D., Marrs, J. A., Nielsen, C. P. & Sagar, A., 2000), Kates et al. (Kates, R. W., Hohenemser, C. & Kasperson, J. X., 1985), Robinson (Robinson, R. D., 1988: 5-39), Leonard-Barton (Leonard-Barton, D., 1990: 45), O’Callaghan (O’Callaghan, P. W., 1996: 91-100), and UNEP (UNEP, 1995, 2002j) were used to consider what is called the regimes’ *issue-actor direction* in terms of UNEP’s IDCP and WA SIG’s CPS application of three multi-stakeholder facilitation strategies for the development of sustainability partnerships in preventative technology transfer.

This study's aim of contemplating the significance of UNEP's IDCP and WA SIG's CPS was to take stock of recent pioneering developments in the delivery of multi-stakeholder partnership strategies in preventative technology transfer in order to make a contribution to the fledgeling International Relations research field of regime policy making and management in pollution prevention. The methodological apparatus implemented in this thesis is an integrated multi-disciplinary research design which ensures the freedom to get a sense of the following important aspects of regime performance: the regimes' overall nature, function, and operation as well as the regimes' stakeholders, their functions and relationships (issue-actor compass); the regimes' sustainability facilitation policy (issue agenda and actor agenda) as well as their sustainability facilitation strategy (issue-actor direction). The triple-phase methodological apparatus was rigorously applied in this thesis to bring to the surface the performance of the multi-stakeholder partnership strategies developed and employed by UNEP's IDCP and WA SIG's CPS for the facilitation of preventative technology transfer. In addition, the triple-phase methodology served the detection of multi-stakeholder partnership strategy outcomes on the basis of regime value implementation. For the assessment of regime performance, the methodology therefore assisted with identifying UNEP's IDCP and WA SIG's CPS values, the regimes' resources to live up to these values, and their processes of applying the resources available to implement their values.

To be sure, at the core of the assessment of the significance of UNEP's IDCP and WA SIG's CPS in international relations was the question of how the two pollution prevention regimes encouraged multi-stakeholder co-operation in preventative technology transfer that improves the quality and pace of sustainable development. To address this question, UNEP's IDCP and WA SIG's CPS



post-inauguration communication was examined in terms of sustainability facilitation ideas. This included, among others, facts, theories, and values about preventative technology transfer. With regard to sustainability facilitation hazards in the regimes' post-inauguration communication, difficulties of, and thus opportunities for, preventative technology transfer were studied. As a result of a direct-observation-based hypothetico-deductive approach (Robinson, R. D., 1988: 37), three core sustainability facilitation interests common to both pollution prevention regimes were identified in the expedition of preventative technology transfer facilitation. The first interest is UNEP's IDCP and WA SIG's CPS *internal sustainability communication* or the sharing of sustainability experience within the regimes. The second interest is the regimes' *external sustainability communication* or sustainability dialogue with interested parties of the regimes. The third interest is the regimes' sustainability *education and training* or formalised sustainability knowledge transfer within the regimes and between them and interested parties. In order to determine the significance of the pollution prevention regimes in international relations, UNEP's IDCP and WA SIG's CPS sustainability communication was examined and the regimes' effectiveness and resilience in achieving interest-specific collective decisions and behaviour over time was investigated. For this purpose, UNEP's IDCP and WA SIG's CPS development of three regime interest-oriented sustainability facilitation strategies for the evolution of multi-stakeholder partnerships in preventative technology transfer were gauged. These strategies encompass *intra-institutional preventative technology transfer through internal sustainability communication*, *inter-institutional preventative technology transfer through external sustainability communication*, and *intra- and inter-institutional preventative technology transfer through sustainability education and training*. The evaluation of the strategies was made in terms of their ability to mould the sustainability agenda, progress the

state of the sustainability debate, or assist in sorting out specific sustainability problems in preventative technology transfer.

## **2.2 Regime Significance and Regime Facilitation Mode**

As explicated above, UNEP's IDCP and WA SIG's CPS facilitation of preventative technology transfer was chosen as this project's main topic or dependent variable because insight was sought into how specific multi-stakeholder co-operation matters nominally addressed by these regimes were dealt with. Regime facilitation, as documented in regime communication, was measured by UNEP's IDCP and WA SIG's CPS policy action for achieving collective decisions and behaviour in preventative technology transfer. Four areas of policy making and management were explored: the prevention regimes' issue-actor compass, issue agenda, actor agenda, and issue-actor direction. Evidence in these areas was sought by applying three basic conceptual frameworks as part of a three-phase research methodology. This permitted the characterisation and exploration of the content of regime communication in terms of issues in sustainability facilitation and issue-related hazards or opportunities of sustainability facilitation to be addressed by multi-stakeholder partnership strategies formulated and executed by UNEP's IDCP and WA SIG's CPS. The aim here was to investigate regime idea innovation, selection, and diffusion not only to establish whether regime facilitation enhanced stakeholder co-operation that is conducive to sustainable development, but also to determine how regime facilitation provided stakeholders with additional capacity to deal with the complexities of preventative technology transfer. Hence, the question of regime facilitation, as treated in this thesis, focuses on *route* as much as it does on *content*.

To ascertain regime facilitation mode, this study explored three independent variables: (1) *detachment*; (2) *dependence*; and (3) *dominance*. For the purposes of this study, Charles W. Morris (1964: 20-26) was expanded upon, defining these variables as the three factors of action in regime communication. Specifically, detachment is a situation where information is obtained about the circumstances in which action is to be taken; dependence is a situation where a choice is made among options that are favoured; and dominance is a situation where the selected option is acted upon by an actor adopting a specific course of behaviour. These communicational variables were decided upon as they allow an appreciation of the patterns of preferential behaviour exhibited in the regimes' facilitation of preventative technology transfer. The initial hypothesis was that detachment, dependence, and dominance all played a part in UNEP's IDCP and WA SIG's CPS policy action for achieving collective decisions and behaviour in preventative technology transfer.

To test the hypothesis, this study explored UNEP's IDCP and WA SIG's CPS sustainability communication for a categorisation of what is termed *issue-actor configurations* involved in preventative technology transfer. The regimes' sustainability communication as issued in publicly available activity reports and minutes of meetings constituted the source for issue-actor configurations. This openly accessible data was chosen in preference to the regimes' (secret) archival material because it constitutes the kind of information from which an interested party would gain a first impression of the regimes. Issue-actor configurations were studied because they are reflective of regime thinking and activity and indicative of thinking and activity specific to (a) particular regime(s). In UNEP's IDCP and WA SIG's CPS sustainability communication, issue-actor configurations are examples of preferential behaviour exhibited in the regimes'

facilitation of preventative technology transfer. In this thesis, the role of detachment, dependence, and dominance was measured by the *occurrence* of the variable-related issue-actor configurations. Thus, a sustainability issue treated by an actor as a piece of information to be considered for action was categorised as a *designative* issue-actor configuration and, as such, as an instance of detachment. A sustainability issue selected by an actor as the preferred choice was tagged as an *appraisive* issue-actor configuration and, as such, as an instance of dependence. A sustainability issue acted upon by an actor in a particular fashion was classified as a *prescriptive* issue-actor configuration and, as such, as an instance of dominance.

In order to establish regime facilitation mode, the patterns of preferential behaviour exhibited in the regimes' facilitation of preventative technology transfer were analysed. Hence, the frequency of the issue-actor configurations associated with detachment, dependence, and dominance was determined for UNEP's IDCP and WA SIG's CPS issue-actor compass, issue agenda, actor agenda, and issue-actor direction. In this thesis, the *sway* of detachment, dependence, and dominance in UNEP's IDCP and WA SIG's CPS policy action was also explored. This was measured by *frequency* comparisons of the variable-related issue-actor configurations in order to consider a possible *balance* of the three factors of action in regime communication. The *stability* or otherwise of what is labelled *action-factor equilibrium* was used to ascertain the ways in which a regime can modify collective behaviour for improved sustainable development results.

### **2.2.1 Regime Issue-Actor Compass**

Dealing with the prevention regimes' core sustainability facilitation mindset and outlook required the formulation of a first conceptual framework to furnish an idea-orientated characterisation and exploration of the level and kind of communication determining the content of the elemental to higher order concepts in UNEP's IDCP and WA SIG's CPS. The conceptual framework draws from the political science literature on International Regime Theory and was applied throughout the study. In this thesis, the prevention regimes' communication shaping the content of sustainability facilitation issues was examined employing Krasner's pertinent and widely accepted definition of international regimes, which are 'implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations' (Krasner, S. D., 1983: 2). Using this definition has the additional benefit of covering the elemental to higher order concepts used in this thesis for a discussion of the role of institutional learning in UNEP's IDCP and WA SIG's CPS. Hence, principles of the regimes here are seen as '... beliefs of fact, causation, and rectitude' (Krasner, S. D., 1983: 2). Rules of the regimes are understood as '... specific prescriptions or proscriptions for action' (Krasner, S. D., 1983: 2). Decision-making procedures of the regimes are conceived of as the '... prevailing practices for making and implementing collective choice' (Krasner, S. D., 1983: 2). Finally, norms of the regimes are considered to be '... standards of behavior defined in terms of rights and obligations' (Krasner, S. D., 1983: 2).

### **2.2.2 Regime Issue Agenda and Regime Actor Agenda**

Attending to the prevention regimes' recognition of sustainability facilitation issues and development of new partnership initiatives engaging stakeholders in sustainability issue management necessitated the formulation of a second

conceptual framework. This offered an idea-orientated characterisation and exploration of the level and kind of interest shown by UNEP's IDCP and WA SIG's CPS in the formulation of sustainability facilitation issues. This conceptual framework draws from the political science literature on problem definition and issue framing (Hajer, M. A., 1995; Jachtenfuchs, M. & Huber, M., 1993; Rochefort, D. A. & Cobb, R. W., 1994), issue attention cycles (Downs, A., 1972: 38–50), and agenda setting (Kingdon, J. W., 1984) and was applied throughout the study. In order to embrace the dynamic aspect of the prevention regimes' formulation of sustainability facilitation issues, the framework used here employs, in particular, elements of the Stages Approach to the policy process, the Institutional Rational Choice view, and Innovation and Diffusion models (Sabatier, P. A., 1999). In this thesis, the prevention regimes' communication about sustainability facilitation issues was considered in terms of ideas and hazards using cause and effect relationships.

Defining sustainability facilitation issues in terms of ideas and hazards assists in making a determination about what drives UNEP's IDCP and WA SIG's CPS development of multi-stakeholder partnerships in preventative technology transfer. Here, considerations comprise the interest in the technologies themselves, a means for meeting basic demands, or the source of pollutants of concern. Sustainability facilitation hazards are understood as difficulties of, and thus opportunities for, formulating and implementing sustainability facilitation for the development of multi-stakeholder partnerships in preventative technology transfer (Kates, R. W., Hohenemser, C. & Kasperson, J. X., 1985; Norberg-Bohm, V., Clark, W. C., Bakshi, B., Berkenkamp, J., Bishko, S. A., Koehler, M. D., Marrs, J. A., Nielsen, C. P. & Sagar, A., 2000). The classification of sustainability facilitation introduced here was applied throughout the project. The use of the

categories in this classification is intended to be purely descriptive; no ordering or priority in how or when the regimes address them was assumed.

For the purposes of this project, sustainability facilitation issues in three basic areas of preventative technology transfer were explored. A sustainability facilitation issue can revolve around an idea concerning a particular choice of technologies or practices, with the hazard lying in the implications for the environment of those technologies or practices. The exposure of people and things to a particular technology can be at the heart of an issue, with the hazard being the exposure of specific localities to different sorts of stresses. The issue of technology utilisation includes the consequences to people and things they value, with the hazard constituting the possible impacts of environmental change on people or on things they value. For an assessment of institutional learning, these three basic areas in UNEP's IDCP and WA SIG's CPS preventative technology transfer were also considered from a dynamic perspective. Accordingly, the prevention regimes' policy action in terms of ideas put forward in response to environmental concerns in the regimes' formulation of sustainability facilitation issues was also examined. These ideas include the change of choice of technologies or practices, the change of exposure of people and things, and the change of consequences to people and things they value. The motivation behind the change introduced in these areas of preventative technology transfer was also investigated. Three objects of concern can be distinguished here. Emissions are at the heart of action that would directly affect emissions of pollutants of interest through changing the choice of technologies or practices. The environment is the focus of action that would directly affect the volume of emissions remaining in the environment or would directly alter valued environmental properties. Impact is at the heart of action that alters the effects of changes in the environment on people and things they value. Finally, the approach taken to the change

implemented in the three areas of preventative technology transfer was explored. Of interest here were two area-specific techniques. Preventative or mitigating action in the change of choice of technologies or practices, and adaptation action in the change of exposure of people and things or in the change of consequences to people and things they value.

In order to gauge the prevention regimes' formulation of sustainability facilitation issues, UNEP's IDCP and WA SIG's CPS were explored in terms of their encouragement of preventative technology transfer which minimises the generation of harmful wastes and maximises the efficiency of the use of energy and materials (UNEP, 1995: 115 seq). For the purposes of this project, *technology* is defined here as the '... capability, that is, physical structure or knowledge embodied in an artefact (software, hardware, or methodology) that aids in accomplishing some task' (Leonard Barton, D., 1990: 45). *Technology transfer*, as it is understood here, is

the development by people in one country of the capacity on the part of nationals of another country to use, adopt, replicate, modify, or further expand the knowledge and skills associated either with a different manner of consumption or product use, or a different method of manufacture or performance of either a product or service. (Robinson, R. D., 1988: 10)

Specifically, UNEP's IDCP and WA SIG's CPS encouragement of preventative technology transfer was investigated in the three key areas of production and consumption.

In production processes, the focus of this thesis is on the transfer of environmentally sound technology preserving raw materials, water and energy, eradicating toxic and hazardous raw materials, and/or diminishing the quantity and toxicity of all emissions and wastes at source throughout the production process (UNEP, 2002j). There is an array of environmental concerns in production processes. For instance, a minimisation of waste of energy, water and



materials can be arrived at by improving processes through the selection of new processes and alterations to existing ones. Similarly, by incorporating impacts on the local and global environment, advanced planning can support the minimisation of environmental effects of new activities through the implementation and monitoring of measures necessary to minimise, prevent or eliminate pollution (O'Callaghan, P. W., 1996: 91-92).

In product development, the interest in this thesis centres on the transfer of environmentally sound technologies which reduce the environmental, health and safety impacts of a product over its entire life cycle, that is raw materials extraction, manufacturing, use, and disposal (UNEP, 2002j). Environmental concerns in product development revolve around product planning with cradle-to-grave environmental impact assessment. For example, waste avoidance is an issue in product manufacture, as is the use of exported products. At the heart of considerations is the reclamation, reuse, recycling, and ultimate disposal of products (O'Callaghan, P. W., 1996: 99-100).

In the provision of services, this thesis considers the transfer of environmentally sound technology incorporating environmental concerns into designing and delivering services (UNEP, 2002j). Environmental issues in the provision of services centre on current environmental effects of past usage of facilities. For instance, present environmental risks of facilities can originate from heating, ventilation, lighting, refrigeration, air conditioning, hot water, compressed air, as well as waste disposal systems to air, water, and land (O'Callaghan, P. W., 1996: 92-93).

In order to measure the prevention regimes' performance in addressing sustainability facilitation issues, UNEP's IDCP and WA SIG's CPS development

of multi-stakeholder partnerships in preventative technology transfer was examined. For the purposes of this project, partnership is defined as ‘an agreement between two or more legal entities – persons or corporations – to work together for a specified purpose under a joint management team’ (Robinson, R. D., 1988: 39). As part of such partnerships, the transfer of technology packages can run the whole gamut of contractual agreements ranging from the export of hardware, such as capital equipment, to the licensing of industrial property and know-how (Robinson, R. D., 1988: 5-6). For example, in the construction area, technology contracts, in order of commitment, can involve construction supervision, including the transfer of relevant skills, if desired. ‘Turnkey’ implies construction and bringing a plant or project to the point of operation. ‘Turnkey-plus’ covers construction, bringing to the point of operation, and training of local staff to operate and maintain the plant or project. ‘Production-sharing’ is the export of an industrial plant, for which payment is effected in product from the plant. Finally, ‘co-production’ means the export of some technology, exchange of parts or intermediates both ways, and manufacture of the final good in both, foreign and domestic, plants.

However, technology contracts can also be of the ‘consulting’ kind for the provision of technical assistance or managerial skills in specific operational areas, such as manufacturing, marketing, architectural and engineering, research and development, and seminar or on-the-job training. In multi-stakeholder partnerships, up to four main actor groups can be involved in the transfer of technology: public international bodies (for instance, UN agencies, etc.), governments, non-profit organisations (for instance, foundations, universities, etc.), and private business firms (Robinson, R. D., 1988: 23). International agencies, governments, and non-profit organisations often act as transfer conduits, while business firms play the part of technology supplier or recipient (Robinson,

R. D., 1988: 5-39). In this project, UNEP's IDCP and WA SIG's CPS multi-stakeholder partnerships were examined in terms of the extent to which actors were encouraged to exploit the opportunities for sustainable development offered by Cleaner Production, both as cleaner technology recipients, cleaner technology suppliers, or facilitators of cleaner technology transfer.

### **2.2.3 Regime Issue-Actor Direction**

Attending to the prevention regimes' application of three sustainability facilitation strategies for the development of multi-stakeholder partnerships in preventative technology transfer called for the formulation of a third conceptual framework. This presents an 'over-time'-orientated characterisation and exploration of the level and kind of interest shown by UNEP's IDCP and WA SIG's CPS in the management of sustainability facilitation issues. The conceptual framework draws from the literature of policy analysis and hazard management (Jones, C. O., 1984; Kates, R. W., Hohenemser, C. & Kasperson, J. X., 1985) and was applied throughout the project. Emphasising the stages of issue development and tasks performed in each, this literature permits a consideration of issue framing in terms of the innovation, selection, and diffusion of ideas, elucidating changes in how issues are defined and framed in relation to other issues. Following learning as evolution thinking (Argyris, C. & Schon, D., 1978; Haas, P. M. & Haas, E. B., 1995: 255–285), the data on the prevention regimes' processes of idea innovation, selection, and diffusion in four strategy areas of sustainability facilitation was of particular interest. These areas encompass UNEP's IDCP and WA SIG's CPS strategy definition, planning, measurement, and review. Data on these strategy areas was used to gain insight into how specific multi-stakeholder co-operation matters nominally addressed by the prevention regimes were dealt with in the course of policy action. In terms of innovation processes in

sustainability facilitation issues, this thesis asked what new ideas (that is, facts, theories, values, etc.) emerged as relevant to the performance of the specific strategy, when these ideas materialized, from what internal or external sources they occurred, and in which regime they surfaced. As to selection processes in sustainability facilitation issues, the centre of attention was on which strategy choices were made in reducing the range of possibilities presented by innovation, which strategy choice achieved more extensive acceptance among a larger group of regime actors, what the timing was of these strategy choices, and what institutions were central to influencing the strategy choices. Regarding diffusion processes in sustainability facilitation issues, the focus was on which ideas, strategy proposals, or world views that endured the selection processes within a given regime were successfully exported to other institutions, when this diffusion occurred, which actor was involved as exporter, and what interested parties were the most receptive targets for its exports.

In order to better understand the management of sustainability facilitation issues, this thesis considered issue framing in the processes of innovation, selection, and diffusion in a bid to describe changes in how sustainability facilitation hazards are defined and framed in relation to other sustainability facilitation hazards and issues. For each regime, this involved tracing the emergence of the sustainability facilitation hazard in question onto that regime's agenda and its relative status or position on the agenda through time. Research here also located the images associated with the sustainability facilitation hazard and its connection to other sustainability facilitation hazards and issues as these connections and images change over time. In this project, an attempt was made to distinguish a regime's individual framing of a sustainability facilitation issue from its perception of the way the issue was framed by other relevant institutions.

In accordance with the above criteria, issue framing in this project was gauged in the following ways. First, by when issues, images, and sustainability facilitation hazards emerged, especially in what position, connections to other issues, and rates of change. Second, by the permanency and saliency of the sustainability facilitation hazard on the regimes' agendas as reflected in how often the hazard was referred to in post-inauguration communication. Third, by the level of commitment to the management of sustainability facilitation hazards, as indicated in potency of language, and amount of space. Last, by the origins of changes in issues, connections, and rankings in terms of self, external stakeholders, be they from international institutions, or personal contacts, and what chief background events there were. In this regard, several general research questions as to issue framing arise: when and how does each regime recognise the sustainability facilitation hazard for the first time? How does the regime define the sustainability facilitation issue over time? With what images do the regimes associate the sustainability facilitation issue, and how do these change over time? How do the regimes rank and relate the sustainability facilitation hazards addressed in the project to each other over time? And, what is the position of the sustainability facilitation hazard on each regime's overall sustainability facilitation agenda?

In addition to gathering data on management actions dealing with sustainability facilitation hazards, comparative data was collected that allowed the action to be considered in a broader context. This was done because these contextual trends may form part of the explanatory backdrop of what is picked up under the management actions. Work in this area involved the documentation of major background events, trends, and processes (that is, economic, environmental, political, etc.) that may be relevant to institutional learning about the sustainability facilitation hazard at hand. This included setting the regimes in their

contexts. The initial research in this area consisted of the construction of a chronology of trends that seemed to be important in the individual regime studies.

The individual sustainability facilitation hazard management actions are elucidated in greater detail in the paragraphs below. Each of those paragraphs is organised as follows. First, a general statement is made about the purpose and scope of the research on this specific action, that is, why data was being congregated on this action, the general approach to it, and remarks on special difficulties encountered in the project. Second, a statement is made about indicators for this action, that is, what evidence was required for characterising performance of the action. Third, general questions about the action are posed, that is, broad questions are asked in an attempt to capture the critical subject matter that is to be comprehended through research on the action, to elaborate on the definition of the action for the particular case of sustainability facilitation management, and to assist in providing a rationale for the collection of data. Finally, research questions are posed, that is, case specific questions are asked. The emphasis of the research is on changes in action performance, rather than on the actions themselves. The research questions thus focus on matters that seemed likely to illuminate the overall question of institutional learning. The questions were addressed primarily to provide comparable data for cross-institutional analysis.

### **Policy definition and multi-stakeholder partnership strategy**

The purpose of research on UNEP's IDCP and WA SIG's CPS action on policy definition with respect to formulating and executing multi-stakeholder partnership strategies was to trace institutional facilitation activity. This included the regimes' changes in setting sustainability facilitation policy goals, the design of a package

of policy management responses appropriate for achieving these policy goals, and the selection of methods, such as command and control, incentives, or persuasion, for implementing those institutional responses. These facilitation policy goals include designs for promoting interaction using two main approaches, first, through intra-institutional sustainability facilitation, and second, through inter-institutional sustainability facilitation. In this study, policy goals are statements of objectives or conditions that the regimes wish to bring about. Facilitation partnership strategies here are designs for how – in what combination and at what time – particular policy response options will be combined to achieve a facilitation policy goal. These facilitation partnership strategies include the facilitation of preventative technology transfer through, first, experience sharing, second, dialogue with interested parties, and third, education and training. Thus, strategies here are conceived of as designs organising particular means, that is, policy response options, to achieve particular ends, that is, policy goals. Furthermore, strategy formulation here is taken to include not only making choices from among different kinds of strategies, but also determining the resources allocated to different policy response options and to the strategy as a whole.

As the regimes' facilitation policy goals for managing sustainability facilitation hazards by means of partnership strategies may be formulated with regard to all actors and not just governments, this study adopted a balanced research approach that examines the relevance of all stakeholders. The regimes' policy goals can be general or very specific. They can create chains that are not necessarily found as 'chains of command' in published materials. Policy goals from various echelons can relate to other regime activities. And policy goals are usually targeted with a precise time horizon, the presence or absence of which this project was meticulous to record. Partnership strategies depend on actors' frames and

perspectives. In this project, research on the formulation and execution of facilitation policy goals for managing sustainability facilitation hazards by means of facilitation partnership strategies was accompanied by assiduous reference to the framing of sustainability facilitation issues. Furthermore, an attempt was made to distinguish the degree to which facilitation policy goals and partnership strategies were driven by express concern for the sustainability facilitation hazard, general political or economic interest, or other policies.

Performance in UNEP's IDCP and WA SIG's CPS action on policy definition with respect to formulating and executing multi-stakeholder partnership strategies was gauged in a number of ways. First, by when a certain preventative facilitation policy goal was first established, what the target of the policy goal was (that is, a particular actor, policy, relationship, etc.). Second, for how long discussions about policy alternatives went. Third, what the alterations in the dominance of alternative standpoints were and when such discussions were decided. Last, where innovations in the formulation and execution of the preventative facilitation policy goal originated from. General research questions on the regimes' policy definition and commitment were examined for each regime based on published materials. First, what policy goals for managing the preventative sustainability facilitation hazards in question have been proposed? Research on this question attempted to distinguish among the classic hazard management goals, that is, hazard acceptance or deciding to let it happen, hazard spreading or the introduction of insurance-type plans, reduction or prevention of the causes of facilitation hazards, or adjustment or adaptation to the consequences of facilitation hazards. Second, what approaches regarding reduction or prevention of the causes responsible for the sustainability facilitation hazard in question have been proposed? Third, what approaches concerning adaptation or adjustment to the impacts of the sustainability facilitation hazard in question have been



recommended? Fourth, what approaches for gathering additional information to inform policy management choices have been suggested? Last, what is the relationship among the potential elements of the hazard management approach noted above?

### **Policy planning and multi-stakeholder partnership strategy**

The aim of research on IDCP and CPS action on policy planning with regard to devising multi-stakeholder partnership strategies was to trace changes in understanding the character, causes, effects, probability, and occurrence of the sustainability facilitation hazard in question. Here, the separation of all causes and effects addressed by the regimes was the particular focus. IDCP and CPS action on policy planning and the regimes' performance with respect to formulating multi-stakeholder partnership strategies was measured in the following ways. First, by when a certain way of characterising the sustainability facilitation hazard became established. Second, what the period was over which discussions about different portrayals extended. Third, what the adjustments were in the prominence of alternative opinions. Fourth, when discussions about characterisations were decided. Fifth, what the assessments of probability of the sustainability facilitation hazard were. Sixth, where innovations in portrayals and evaluations derived from. Last, how and when corroboration of the estimation of the sustainability facilitation hazard transpired. General questions on the regimes' policy planning formulation were examined for the regimes based on published materials. First, the regime was probed as to what it considered to be the activities responsible for the sustainability facilitation hazard in question. Second, the regime's idea as to the character and magnitude of the sustainability facilitation hazard was investigated. Third, the regime was considered in terms of what it thought the impacts of the sustainability facilitation hazard were or would be.

IDCP and CPS action on policy planning a propos executing multi-stakeholder partnership strategies was researched with the purpose of documenting and explaining changes in the selection of possible response options, including the likely effectiveness and costs of such options. In this thesis, response options are identifiable measures that a regime might undertake to help manage a sustainability facilitation hazard. Policy response options may be technological, organisational, or behavioural in kind. An example of a response option is the initiation of a media campaign to raise consumer awareness about the consequences of purchase decisions. In this thesis, assessments of policy response options are systematic examinations of the viability and advantages of particular measures. Assessments do not necessarily involve conclusions or recommendations regarding best practice. Here, policy response options were considered for all stakeholders, avoiding partiality to state actors. The research aimed at showing how each regime assessed the expected effectiveness of policy response options for managing sustainability facilitation hazards. The focus of this project is on policy responses at a particular point in time as well as changes in the course of time in policy response actions. Policy response options cover the full range of possible responses, including technical, institutional, and behavioural measures to alter sustainability changes and impacts. However, attention in this project centred on specific policy response options only when some stakeholder has explicitly identified a potential intervention for reducing the sustainability facilitation hazard at hand. Costs were interpreted to comprise monetary, political, and other opportunity costs.

Functioning of IDCP and CPS action on policy planning with regard to executing multi-stakeholder partnership strategies was judged in a range of ways. First, by when particular policy response options were first inputted into the discussions.

Second, when careful cost estimates were first employed with respect to these options. Third, for how long deliberations about ascendancy of alternatives went. Fourth, what the alteration in the control of alternative opinions was, and when such contests were settled. Fifth, how many of the policy options were actively contemplated at a particular point in time, and what the balance among procedural, institutional, and behavioural preferences was. Sixth, where innovations in policy options and their appraisals were instigated. Last, what the object of response options were (that is, whether unilateral, bilateral, or multilateral, etc.). General questions on the regimes' policy planning execution were examined for each regime based on published material. The project concerned itself with what each regime considered being the most important policy response options for adapting to the sustainability changes associated with the facilitation hazard in question, and what the expected costs and benefits were.

### **Policy measurement and multi-stakeholder partnership strategy**

The intention behind research on UNEP's IDCP and WA SIG's CPS action on policy measurement with respect to multi-stakeholder partnership strategies was to document the regimes' efforts to reflect on and evaluate their own and others' performance in contributing to the management of the sustainability facilitation hazard under consideration. In this project, policy measurement is defined to include any form of conscious feedback between observations, actions, and objectives. Thus, policy measurement here is a determination of the degree to which regimes both deliberate on their performance of policy management over time and discover better evaluation skills and practices. Measurement of performance is a contemplative action which functions as an effectual institutional learning instrument. It is valuable to differentiate between the definition and planning of policy options dealing with sustainability facilitation hazards and the

measurement of policy goals, the latter being a retrospective scrutiny of a process with a view to ascertaining the strong suits and weak spots of that process as a procedure for performing the definition and planning of policy options contending with sustainability facilitation hazards.

Execution of UNEP's IDCP and WA SIG's CPS action on policy measurement with regard to multi-stakeholder partnership strategies was gauged by when a particular (kind of) evaluation was embarked on; when the results of an evaluation became evident in relation to a particular policy management action and specific stakeholders; when a particular type of evaluation became institutionalised; when and where (that is, by which stakeholders at which place) innovation in measurement techniques and procedures took place; and when, where, and how the evaluation of the human aspects of the sustainability facilitation hazard in question and the social science research requirements were concluded. General questions on the regimes' measurement policy were examined for each regime based on published materials. To begin with, the project sought to determine what the deliberate measurements were that the regimes initiated in relation to sustainability facilitation hazards. In this connection, it was asked whether the measurements were activated by technical experts, business managers, reporters, or politicians, or by a blend of these actors. A related question was which actors controlled the consecutive parts of policy measurement? However, the receiving end was also significant, so it needed to be ascertained who the subject of the measurement was, and who was actually reached. Similarly, the intensity and nature of the scope of the attempted measurements needed to be established. Connected with this was the degree to which the measurements were ad hoc, and to what extent they created or utilised new institutional mechanisms. Likewise, the measurements can span more than one policy management action, and innovations (in another place in the system) may facilitate (alter circumstances of)

measurement. So the sphere of measurement required specification, as well as the intentions and factors that inspired it. However, orientation was also of interest, so it was asked what the effects of the measurement were, whether they were deliberate or accidental, and over what time scale they developed. But more importantly, did the measurement have practical impacts? Whether the measurement affected perceptions or assumptions motivating the sustainability facilitation hazard management discussion was a significant question here. This is linked to whether stakeholders were attempting to circumvent measurement, and if so, by what means. For an elucidation of this, there needed to be reflection on the parts actually played by various stakeholders in the sustainability facilitation hazard management process. Lastly, the question was posed whether measurement efforts themselves were being measured, and if so, how.

### **Policy review and multi-stakeholder partnership strategy**

The rationale behind the research on UNEP's IDCP and WA SIG's CPS action on policy review with regard to multi-stakeholder partnership strategies was to trace the evolution of efforts by the regimes to record actual changes in the areas of relevance. This includes, for example, aspects of the environment affected by the sustainability facilitation hazard in question, such as global temperature change. This covers emissions, such as carbon dioxide, methane or chlorofluorocarbons. Another case in point is human responses, such as adaptation to the hazard or changes in behaviour to the facilitation hazard in question. But there is also the aspect of results, such as changes in public opinion or in consumption patterns, of management approaches and specific implementation measures.

Operation of UNEP's IDCP and WA SIG's CPS action on policy review with regard to multi-stakeholder partnership strategies was gauged by when particular

types of monitoring systems were first put in place by a regime; where innovations in monitoring initiated from; when particular types of monitoring data were first used (that is, collected, reported, averaged, etc.) by a regime, and whether or not the regime created it in the first place. For each of the general questions, attention was centred on the existence of monitoring programmes and also on their adequacy and inferences. Questions were examined for each regime based on published material. The key question here is whether, and if so, what kind of, provisions had been made for monitoring the activities relevant to the sustainability facilitation hazard at hand. Moreover, a determination was required as to whether monitoring of the human activities leading to the sustainability facilitation hazard was provided for. In addition, the stipulations made for monitoring changes in the stakeholder system needed to be established. Furthermore, the matter had to be dealt with whether, and if so, what kind of, monitoring of the impacts of the sustainability facilitation hazard in question was maintained. Lastly, the stakeholder responses to the sustainability facilitation hazards in question required investigation as to whether, and if so, what kind of, monitoring they had been the object of.

### **3 DOMINANCE IN REGIME COMMUNICATION**

In order to ascertain regime facilitation mode, the regimes' facilitation of preventative technology transfer was analysed for patterns of preferential behaviour. The opening hypothesis was that the patterns of detachment, dependence, and dominance all play a role in UNEP's IDCP and WA SIG's CPS policy action for reaching collective decisions and behaviour in preventative technology transfer. Studying the regimes' sustainability communication, strong evidence of the preferential behaviour pattern of dominance in the regimes' issue-actor compass and issue agenda was found. These processes of UNEP's IDCP and WA SIG's CPS policy action in preventative technology transfer are shaped by a frequency of prescriptive issue-actor configurations. Here, the regimes' sustainability facilitation is governed by sustainability issues that are acted upon in particular ways.

#### **3.1 Regime Effectiveness and Issue-Actor Compass**

An analysis of the regimes' sustainability communication shows strong evidence supporting the notion of dominance playing a role in the regimes' facilitation of preventative technology transfer. Specifically, the data demonstrate that the heavy frequency of prescriptive issue-actor configurations in multi-stakeholder co-operation is a factor contributing to the regimes' effectiveness in the definition of the issue-actor compass. The ability of stakeholders to co-operate is enhanced to the extent that regime sustainability thinking and activity is delineated by the respective regime issue-actor compass. Studying IDCP and CPS actors in terms of their shared regime principles, norms, and rules brings to light an array of reasoned motivations in the policy making and management process. The prevention regimes' driving forces provide an impetus for and a direction in

sustainability facilitation thinking, sustainability facilitation activities, and sustainability facilitation relations with external stakeholders.

### **3.1.1 UNEP's IDCP Issue-Actor Compass**

The IDCP is a rule-based regime that endeavours to support the progress of partnerships focusing on the preventative development and transfer of environmentally sound technologies across regional and national borders, industrial sectors, and management functions. In their sustainability thinking, IDCP actors follow shared regime principles, norms, and rules. More specifically, IDCP actors believe that accomplishing sustainability requires a joint effort of all involved and that steps for the protection of the environment must include practices of Sustainable Consumption and Production (UNEP, 2004a). They consider preventative initiatives, like Cleaner Production, Eco-efficiency, Green Productivity, and Pollution Prevention, to be the number one choice in sustainability action and that such preventative initiatives are to be encouraged by means that foster the development, support, and implementation of sustainability. Cleaner Production is explicitly seen as an integrated, preventative initiative that is to be applied continuously to industry processes, products, and services in order to promote economic, social, health, safety, and environmental aims. IDCP principles support actors in the up-take of sustainable development. However, actors are not included in the decision-making procedures establishing the principles.

In their sustainability activities, IDCP actors agree to let their collective choice and action be guided by a number of useful *modi operandi*. Within their respective institutions, IDCP actors integrate preventative initiatives into all levels of their organisation by utilising relevant instruments, such as environmental performance



evaluation, environmental accounting, and environmental impact, life cycle, and Cleaner Production assessments. In order to achieve the adoption of Cleaner Production, demanding targets are set and regular progress reports based on recognized management systems are produced (UNEP, 2004a). In Research and Development, the emphasis is on increasing the funding of preventative technology alternatives. IDCP actors help generate innovative solutions by encouraging a move away from end-of-pipe towards preventative initiatives and by promoting the development of products and services that meet the requirements of consumers and the environment. Also, capacity building is fostered and attained by supporting the insertion of sustainability concepts and principles into syllabuses and by producing and conducting relevant awareness, education, and training courses in-house.

In their sustainability relations with external stakeholders, IDCP actors encourage the adoption of Cleaner Production by working together with UNEP and other partnering institutions in promoting the IDCP and monitoring the achievements accomplished in its execution. Instrumental in this regard are partnerships in the development and transfer of environmentally-sound technology across institutional boundaries and national borders (UNEP, 2004a). By using their sway to push for the inclusion of Sustainable Consumption and Production practices, IDCP actors provide leadership. This is flanked by an exchange of ideas and the communication of knowledge about the practice of preventative approaches and the usefulness of their implementation. As with the regime's principles, IDCP norms promote sustainable development behaviour by actors. But input into the decision-making on these norms is not sought from actors.

### **3.1.2 WA SIG's CPS Issue-Actor Compass**

The CPS is a rule-based regime, analogous to the IDCP, that seeks to promote the progress of partnerships involving the preventative development and transfer of environmentally sound technologies across regional and national borders, industrial sectors, and management functions, although efforts are suited more specifically to regional needs. In their sustainability thinking, CPS actors follow shared regime principles, norms, and rules (WASIG, 2005b). In particular, CPS actors see Cleaner Production explicitly as the permanent implementation of an integrated preventative environmental approach applied to processes, products or services to enhance eco-efficiency and decrease risks to humans and the environment. There are specific targets for each area. For processes, Cleaner Production involves conserving raw materials and decreasing the quantity and toxicity of all emissions and wastes. For products, Cleaner Production implies lessening the overall environmental impacts of the product throughout its life-cycle, from the extraction of the raw materials through to the product's eventual disposal. For services, Cleaner Production entails the incorporation of environmental concerns into designing and delivering services. CPS actors see Cleaner Production as an approach that requires changing mind-sets, responsible environmental management, and appraising technology options. Moreover, CPS actors believe that the broad support and acceptance by major stakeholders of Cleaner Production achieves a variety of important outcomes for Western Australia: it helps the environment; it reduces wastes and pollutants by unit of production output; it presents an opportunity to industries to enhance their competitiveness by trimming down their consumption of materials, energy, toxic substances and water; and it adds to the efficiencies of organisations (WASIG, 2005b). WA SIG's beliefs of fact and causation are useful in moving actors onto the path of sustainable development. But actors do not participate in the regime's prevailing practices of determining these beliefs.

In order to achieve these results for Western Australia, CPS actors contribute in a number of ways in their respective functions (WASIG, 2005b). State and local governments take up and endorse Cleaner Production principles as a favoured approach for implementing policies, programmes and activities, especially by allotting their available resources accordingly with regard to current and future policies and regulations; permits, inspections and enforcement actions; technical assistance, outreach and educational programmes; and new waste management and environmental protection approaches. Manufacturers, service industries, and educational institutions play a part through appreciation and consideration of the Cleaner Production approach and through access to the expertise to apply Cleaner Production principles and practices to their activities.

In their sustainability activities, CPS actors, as do IDCP actors, agree to let their collective choice and action be guided by a number of helpful *modi operandi*. Within their respective institutions, CPS actors make a contribution in various ways (WASIG, 2005b). In their respective organisations, CPS actors across Western Australia promote Cleaner Production in a number of ways. A leadership role is assumed in integrating Cleaner Production into policies and strategies. Commitment to Cleaner Production is demonstrated by ensuring laws and management approaches live up to eco-efficiency. Cleaner technologies are researched, assessed, and installed in corporate processes. Cleaner Production education and training is provided for students and employees. Interest in the Cleaner Production philosophy is elicited in the community and their feedback collected.

In their sustainability relations with external stakeholders, CPS actors, like IDCP actors, make a valuable contribution, but in a number of more specified ways

(WASIG, 2005b). The Commonwealth Government's role is one of promoting Cleaner Production by assisting the exchange of experience and know-how between the States and Territories, having a say in the development of international Cleaner Production agreements, and making certain that legislation and policies at the national level sustain and endorse the implementation of Cleaner Production. The State Government's part is one of leading by example when it comes to organising education campaigns about Cleaner Production for all stakeholders, easing the up-take of Cleaner Production by small and medium sized enterprises with local governments, as well as screening and reporting on progress in Cleaner Production in Western Australia, and making available information to ensure Western Australia stays abreast of national and international best practice in the Cleaner Production field. The job of local governments is one of leading by example in terms of managing education campaigns about Cleaner Production for all stakeholders, and integrating Cleaner Production requirements in approval conditions for planning and development applications and building licences – where appropriate. The part of educational institutions includes the dissemination of results borne by research into Cleaner Production. The function of professional and industry associations encompasses supplying information about Cleaner Production to members, promoting the inclusion of Cleaner Production principles into members' charters, notifying members about Cleaner Production programmes, workshops and funding opportunities, and including accreditation of course delivery for professional associations. The community's role consists of offering input into government policies, and distributing information on Cleaner Production by community groups. As with the regime's beliefs, WA SIG's standards of behaviour advance actors' sustainable development interests. Yet, actors do not partake in the practices for the collective choice regarding these standards.

## **3.2 Regime Resilience and Issue Agenda**

As with the regimes' effectiveness in the definition of the issue-actor compass, the data demonstrate that the frequency of prescriptive issue-actor configurations in multi-stakeholder co-operation is also a factor contributing to the regimes' resilience in the framing of the issue agenda. Collective decisions and behaviour in later periods of the regime history are constrained to the extent that the sustainability issues addressed by the prevention regimes fall within the purview of their previously delineated issue-actor compass. The regimes' prevalent sustainability thinking determines what kind of preventative sustainability ideas are incorporated into regime communication. This, in turn, shapes the ways in which UNEP's IDCP and WA SIG's CPS multi-stakeholder partnerships encourage actors to exploit the opportunities for sustainable development offered by Cleaner Production.

### **3.2.1 UNEP's IDCP Issue Agenda**

Over the period studied, a great variety of ideas for multi-stakeholder initiatives to facilitate sustainability are put forward in UNEP's IDCP sustainability communication (UNEP, 1998m: 24-27, 2001m: 8, 2002s: 9, 2004f: 6-7). These ideas are sustainability facilitation management objectives for the development of multi-stakeholder partnerships involving preventative technology. The ideas that move beyond the innovation process into the selection process cover ways of addressing associated sustainability facilitation hazards. This allows the regimes to address difficulties of, and thus opportunities for, defining and implementing constructive sustainability facilitation management objectives for the development of multi-stakeholder partnerships in preventative technology transfer. The

selected ideas are evidence of the regime's willingness to support the stakeholders' preventative or mitigating action for the purpose of achieving preventative sustainability through a change of choice of technologies or practices. The selected ideas can be categorised in terms of multi-stakeholder partnership initiatives for the prevention regime's internal and external sustainability facilitation.

### **UNEP's IDCP internal sustainability policy action**

In the initial development phases of the IDCP, UNEP follows a practical course by striving to position itself on the world stage, in particular on the questions of what sustainability actually means in a Cleaner Production context and how world-wide Cleaner Production networking can be organised to facilitate sustainability. One of UNEP's major interests, for example, lay in the achievement of preventative sustainability through Cleaner Production. Here, UNEP pursued a number of useful partnership initiatives aiming at the co-ordinated preparation of clear Cleaner Production goals and approaches. UNEP endeavoured to build on the important work of the OECD in developing 'basic capacity level' in regard to Cleaner Production in the Central and Eastern European countries and Newly Independent States. Here, UNEP contributes by measuring the progress of these regional institutions against six major success criteria. These multi-stakeholder-oriented criteria comprise the involvement of local industry, the role of leadership by local 'champions', the focus on action rather than a conference and seminar orientation, the pursuit of a strategic and integrative direction, the recognition of local or regional priorities, and management by goal setting (UNEP, 1998q).

Another one of UNEP's major interests lay in developing world-wide Cleaner Production networking. UNEP's attention was directed to forging a new working group on Cleaner Production information collection and dissemination. This is an important aspect since it ties in with the role of regional 'roundtables' (UNEP, 2001a: 26-28) in co-ordinating the many Cleaner Production initiatives developing world-wide (UNEP, 2001b: 26-28). UNEP's aim here is the co-ordination of these 'roundtables' themselves and their integration into a structured programme, a move which avoids the potential for duplication and conflict. The intention is to connect national and regional roundtables as well as sustainability practitioners worldwide in an Internet-based network dedicated to move forward Cleaner Production and pollution prevention. This programme is also linked with the incorporation as a central element of a 'roundtable of roundtables' meeting into UNEP's subsequent Cleaner Production review seminar because the regional review sessions of the Cleaner Production seminars only partially meet this need.

UNEP soon reached a point where it felt the need to consolidate existing successes rather than embarking on any major new programmes (UNEP, 2001c: 11-12). This is where the regime moved out of its early growth phase and showed a natural penchant to underscore the requirement to ensure that partnership initiatives that had been introduced were supported and sustained (UNEP, 2002e: 17). However, there also developed an interest in propelling the IDCP beyond the initial signing. For example, a forward-looking partnership initiative was set up aiming to advance the Declaration through extended co-operation of UNEP and its partners in facilitating the Declaration's implementation (UNEP, 1998h: 26-27) and ensuring the continued collation and dissemination of information on implementation progress. This initiative was further complemented by the showcasing of Declaration successes in other Cleaner Production events, the

increased dissemination of information materials, and the generation of implementation guidelines, details of which are not provided.

A very significant caesura in the initial development stages of the IDCP can be identified. There was a new focus with UNEP seeking to address sustainable development effectively. Here, the partnership initiative aimed to direct more attention to consumption and demand side matters alongside the predominant consideration given to production and supply side matters (UNEP, 1998i: 5, 2002a: 24-25, 2002b: 13-16, 2002g: 8). Equally important was UNEP's endorsement of Sustainable Consumption patterns. Here, the partnership initiative delineated and elucidated Sustainable Consumption (for instance, better, efficient, different, etc.) with regard to developing and developed countries (UNEP, 2001s: 71, 2001t: 72, 2001u: 71), and initiated a drive to better appreciate what pushes consumption. Breaking down consumption patterns, in particular those of youth (UNEP, 2001a: 24-26), into more manageable parts, as well as tackling in depth age-specific consumption patterns (UNEP, 2001q: 37-40), certainly helped make alterations more easily recognizable so that experiences can be more easily circulated.

In the subsequent development stages of the IDCP, UNEP made further progress by consolidating its position on Cleaner Production and Sustainable Consumption arena-wide and looking towards taking on new actor-specific challenges. For example, one major partnership initiative for UNEP's arena-wide consolidation involved the expansion of the scope of Cleaner Production to deal with Sustainable Consumption, with special attention paid to the rebound effects of unsustainable consumption not further specified at the time. (UNEP, 2001k: 6-7). Significantly, the expanded definition of Cleaner Production is incorporated in Sustainable Consumption thinking (Maltby, L., 2002: 10; UNEP, 2002k: 38,



2002t: 11). Also, the UNEP/SETAC Life Cycle Initiative (UNEP, 2002k: 38), launched in Prague and intended to advance sustainability across the whole life cycle of a product, process, or service, was used as an occasion to communicate the expanded definition. Similarly, the regime formulated and shared plans for instituting system-wide co-operation at the industrial cluster level, the community level, and the national level, addressing environmental and social concerns in the design of products and processes.

In a similar vein, the regime used a partnership initiative to detail the newly amalgamated Sustainable Consumption and Production programme, and to reinforce its links with other development priorities, such as poverty reduction (UNEP, 2001h: 10), access to basic services, including access to water, energy, and food, and economic development. This helps to strengthen the development of a common Sustainable Consumption and Production language (UNEP, 2002g: 8), including indicators, benchmarks, and surveys, and the building and sharing of case studies on successful Sustainable Consumption and Production projects.

### **UNEP's IDCP external sustainability policy action**

In the initial development phases of the IDCP, UNEP judiciously concerned itself with gaining a footing on the world stage and in terms of world-wide networking. For example, one of the key partnership initiatives consisted of putting to good use the facilitator function of UNEP in inter-regional communication. The National Centres for Cleaner Production furthering Cleaner Production in their countries were expanded to serve the regional network as well (UNEP, 1998u: 23-27, 1998x: 21, 2002d: 26-29). A related and forward-looking interest of UNEP was the integration of Cleaner Production into the development of Technical Committee 207 of the International Organization for Standardization. Here, the

regime aimed to actively participate in the review of the ISO 14000 series on environmental management systems (Standards Australia, S. N. Z., 1996), and lobby for Cleaner Production to be defined explicitly in the revision of the series and advance Cleaner Production through its inclusion as a recommended requirement of 'continual improvement'. In this initiative, the critical point was the specification of the more substantive content that Cleaner Production can provide an environmental management system with (UNEP, 1998a: 18-19, 2002n: 21). Another of UNEP's general interests was the realisation of the contribution that Cleaner Production can make to the performance of existing and emerging projects. Here, the regime took a pro-active approach by better promoting the role that Cleaner Production can play in achieving the aims of, for example, the Framework Convention on Climate Change, the embryonic Chemicals Convention, the Montreal Protocol, and the Basel Convention.

In the later development phases of the IDCP, UNEP perceptively concerns itself with consolidating the foothold gained in terms of geographic spread and scope of content and looks towards testing new initiative yardsticks. For example, the regime sets up a partnership initiative securing the continuation of policies, planning and projects orientated towards Cleaner Production. Here, the main focus was on encouraging stakeholders to devise economic and political frameworks, at the national, regional and international levels, that contribute to the adoption of Cleaner Production, the endorsement of the IDCP, and the acquisition of further commitments (UNEP, 2001c: 23). This was supported by the regime's work to mainstream Cleaner Production in environmental governance and national economic development policies and programmes (UNEP, 2002h: 12-13). The related point of interest to UNEP of making progress in the application of Cleaner Production in sectors such as services and infrastructure through the use of complementary approaches.

### **3.2.2 WA SIG's CPS Issue Agenda**

As in UNEP's IDCP, over the period studied, a wide range of ideas for multi-stakeholder initiatives to facilitate sustainability emerged in WA SIG's CPS sustainability communication (WASIG, 2000a, 2000b, 2001, 2002, 2003, 2004). These ideas constituted sustainability facilitation management objectives for the development of multi-stakeholder partnerships involving preventative technology. The ideas that made it beyond the innovation process into the selection process dealt with associated sustainability facilitation hazards. The latter are difficulties of, and thus opportunities for, defining and implementing productive management objectives in sustainability facilitation for the development of multi-stakeholder partnerships in preventative technology transfer. As in the case of UNEP's IDCP, the selected CPS ideas substantiated WA SIG's willingness to support the stakeholders' preventative or mitigating action for the purpose of achieving preventative sustainability through a change of choice of technologies or practices. The selected ideas can be classified in terms of multi-stakeholder partnership strategy initiatives for the regime's internal and external sustainability facilitation.

#### **WA SIG's CPS internal sustainability policy action**

In the initial development phases of the CPS, WA SIG was concerned with positioning itself on the Australian and world stages, in particular in relation to the questions of what sustainability actually means in a Cleaner Production context and how regime-wide Cleaner Production networking can be organised to facilitate sustainability. For example, one of WA SIG's major partnership initiatives involved the drafting of a West Australian Cleaner Production

Statement (WACPS) to catalyse commitment from different stakeholders to promote and facilitate Cleaner Production and Eco-Efficiency (WASIG, 2005b). Wisely, a copy of the draft Statement was circulated to WA SIG participants so that all could have input into the document. As the minutes of the WA SIG meeting record, the introduction of suggested changes to the wording and the format was followed by WA SIG's decision to forward the Statement to the Department of Environmental Protection for consideration with a view to requesting the WA Minister for Environment to endorse it and release it for public comment. The inclusion of these stakeholders at the drafting stage clearly helped the overall aim of the regime which is to work towards the realisation of the objectives and outcomes of the Statement, in co-operation with current and future participants.

WA SIG's attention was also directed towards a partnership initiative establishing and consolidating the WA SIG. Interestingly, the idea of whether to incorporate WA SIG and to have a patron was considered by the Steering Committee, but the decision was made to continue with the existing informal network and to leave the matter of a patron aside. Again the regime aimed at stakeholder inclusion, circulating expressions of interest to all participants in WA SIG to invite nominations. More importantly perhaps, the facilitation of WA SIG's operation was sought, given the regime's dependence on continued funding of the CECP and Chair in Cleaner Production. According to the minutes of the meeting, WA SIG was proactive in seeking industry sponsorship for major events and for general operations, lodging an application for a WA Cleaner Production and Eco-Efficiency Initiative with the Waste Management and Recycling Fund which would allow the CECP to employ a person to work specifically with signatories to the WA Cleaner Production Statement and also allow for two major events to be conducted each year.

A major WA SIG partnership initiative of a different kind involved answering the critical need for an exchange of ideas through a wide variety of site visits, seminars, and workshops with a focus on Cleaner Production. For example, the regime organised a tour of a waste disposal facility which allowed signatories to see the waste acceptance and separation techniques, landfill environmental controls, and the landfill gas collection and power generation system (WASIG, 2000a: 2). Similarly, a site visit arranged by WA SIG gave signatories the opportunity to see a new Rutile Recovery Plant (SRRP) with a payback on investment after about 6 months, consisting of a series of specially designed cyclones, a belt washer and drier, which recovered more than 10,000 tonnes per year of synthetic rutile and petroleum (WASIG, 2000a: 3) and reduces the waste stream to the mine for disposal. CPS signatories also got to attend a tour of a manufacturing facility focussing on energy efficiency and waste minimisation activities, with some of the key projects including the upgrade of the waste water treatment facility so that water can be reused in rinse baths (WASIG, 2001: 2), the addition of hexifloat balls to electroplating baths to diminish heat losses (WASIG, 2001: 2), heat retrieval from the enamel ovens (WASIG, 2001: 2), and the introduction of reusable metal parts frames to replace disposable wooden pallets (WASIG, 2001: 2). CPS signatories also went to a seminar with presentations on a number of important local case studies on lighting fundamentals and the types of energy efficiency improvements that can be made in both industrial and commercial facilities. A very insightful workshop organised by WA SIG addressed questions, such as motor sizing, efficiency, the cubic law effect, and the 'total cost of ownership (TCO)' model (WASIG, 2001: 3), which shows signatories that purchase price, installation costs, electricity costs, repair costs, and equipment reliability all contribute to the total cost of ownership and that of these items the purchase price is a very small percentage.

In the subsequent development stages of the CPS, WA SIG concerned itself with consolidating its position on Cleaner Production and Sustainable Consumption arena-wide and looked towards taking on new actor-specific challenges. One of WA SIG's major foci was on a partnership initiative involving the development of the West Australian Cleaner Production Statement to catalyse more commitment from different stakeholders for the promotion and facilitation of Cleaner Production and Eco-Efficiency. An important caesura was WA SIG's introduction of an up-dated version of the Statement (WASIG, 2004: 2-3), as the up-date was modelled on UNEP's IDCP and more refined in sustainability terms. The Statement was helpful in defining Eco-Efficiency and Cleaner Production. The regime was unambiguous about the contribution CPS actors are expected to make.

Another seminal focus was on a partnership initiative further establishing and consolidating the WA SIG. Here, the regime introduced a new and meaningful logo which consisted of three semi circles intertwined to represent government, industry, and the community working together. Responding to feedback from biannual meeting representatives, WA SIG increased its attempts at delivering more targeted facilitation work. Significantly, efforts were boosted in assisting small businesses to achieve a good level of Cleaner Production and Eco-Efficiency implementation. In addition, more ground work with organisations in key sectors was sought. This went hand in glove with the regime's intention that money raised be used to service not the larger end of town, but to help SMEs which need the assistance more than the larger businesses, as the latter have their own budgets and staff power to implement Cleaner Production and Eco-Efficiency. In its fund raising efforts, WA SIG sensibly sought support from industry, not just from government, aiming to provide enough incentives for businesses to pay, for example, AU\$10,000 to become an industry partner.

WA SIG's partnership initiative for an exchange of ideas through site visits, seminars, and workshops focusing on Cleaner Production was further enhanced. For example, WA SIG organised a site tour of the most advanced ice cream plant in Australasia, located in Balcatta, Perth WA, where efforts have been made to monitor and reduce the use of resources and the production of waste (WASIG, 2002: 3). Employing one of the performance indicators set by the plant's environmental group, made up of the General Manager, senior managers, and general staff, the plant realized a reduction in electricity use in ice cream production by a significant 5% whilst increasing production. WA SIG signatories also got to see a trend-setting industrial compound combining an education centre, a materials recovery facility, a Bedminster in vessel composting facility, and a green waste processing facility (WASIG, 2003: 3-4). Furthermore, as part of its Collaborative Research Centre for Coal in Sustainable Development, WA SIG engaged in a multi-faceted research project which includes a Cleaner Production review (WASIG, 2003: 7).

### **WA SIG's CPS external sustainability policy action**

In the initial development phases of the CPS, WA SIG concerned itself with gaining a footing on the Australian and world Cleaner Production stages as well as in terms of Australia- and world-wide networking. Here, one of the regime's major partnership initiatives involved establishing a discourse with international actors taking an energetic interest in Cleaner Production. For example, WA SIG attended an instructive briefing by a UNEP representative on global trends and challenges in Cleaner Production and UNEP's activities in this area, where CPS actors learned about new developments. For example, how the focus was moving away from factories to the diffuse, non-point sources of pollution. Also, how

mainstreaming (that is, the integration of environment, health and safety functions – a business management approach) was becoming more common. Or how UNEP was using the Awareness and Preparedness for Emergencies at Local Level (APELL) programme to encourage cleaner and safer production (Zwetsloot, G. I. J. M. & Ashford, N. A., 2002: 84-86) in small to medium enterprises (WASIG, 2000a: 3). As well as how UNEP was putting a lot effort into preparing for the planned Rio+10 conference in 2002, conducting undisclosed reviews of the different sectors and establishing where industry has been since the Rio Conference.

WA SIG's attention was also on a partnership initiative establishing a dialogue with Cleaner Production actors in Australia. For example, WA SIG participated at a WA Cleaner Production and Eco-Efficiency Roundtable, focussing on how the signatories to the WA Cleaner Production Statement could move 'from statement to action' (WASIG, 2001: 3), and considered a number of worthwhile projects currently being undertaken in WA and plans from the United Nations Environment Programme, Environment Australia, and the Victorian EPA. In a partnership initiative with greater collaborative quality, WA SIG submitted an expression of interest to Environment Australia for the development of a Cleaner Production monitor, a benchmarking service and relevant life cycle work (WASIG, 2003: 7) in order to take advantage of funding offered by Environment Australia for projects assisting business to improve their environmental performance, as well as to develop and promote new environmental management tools and approaches. In this connection, the regime supported a number of Cleaner Production case studies for WA businesses with support from Environment Australia and the Alternative Energy Development Board (WASIG, 2001: 3).



In a more sector-specific initiative, WA SIG worked in partnership with 14 sponsoring participants (WASIG, 2001: 3), including universities (for instance, Curtin), resource companies (for instance, Alcoa, WMC, BHP, SOG, Rio Tinto), government (ISR) and other research providers (CSIRO) on sustainable resource processing to identify the dimension of the sustainability challenge for the resource sector and to establish research priorities. A number of key research and development areas were identified, for instance, in the Kwinana and Kalgoorlie areas. In an interesting parallel development, the Federal Government was trying to put together a series of eco-efficiency agreements focussed on industry associations, in a bid to use federal funds to deliver some of the WBC initiatives into Australia. One of the projects in line for funding in WA was an eco-efficiency study of the Kwinana Industrial Area expected to trigger in kind support from the CCIWA (WASIG, 2000a: 6). Funding is up to AU\$30,000 per project and with matching funding or in kind support from organisations.

In a more actor-related Sustainability briefing, WA SIG learned about important questions in Sustainable Development (WASIG, 2001: 2), identifying five areas of the regional research focus for Australia. These were: baseline assessment of industry performance, capacities and constraints in relation to Sustainable Development; mineral industry's impact on biodiversity, the effectiveness of management approaches and capacity to promote and enhance conservation; stakeholder engagement to create conditions for change; management of mineral wealth in terms of costs and benefits of development and capacity to promote sustainable economic development; and capacity of industry-based initiatives to promote Sustainable Development. Furthermore, as part of the WA State Government Waste 2020 Taskforce, WA SIG explored vital concepts to minimise the amount of waste being generated in WA through to 2020 (WASIG, 2000a: 8).

In the subsequent development phases of the CPS, WA SIG concerned itself with consolidating the foothold gained in terms of the feeler spread and scope of content, and looked towards testing new yardsticks. Here, the regime's principal attention was on a partnership initiative further developing the dialogue with Cleaner Production actors in Australia. For example, WA SIG used a Johannesburg Debrief to reflect on the outcomes of the Johannesburg World Summit on Sustainable Development (WASIG, 2003: 4), concentrating in particular on the two distinct time frames and agendas to achieve significant advances in eradicating poverty by 2015 and transforming unsustainable patterns of production and consumption by 2050. On a financial note, WA SIG attended a seminar to receive useful information on the funding programmes for Sustainable Development available (WASIG, 2000a: 6-7, 2003: 6).

Furthermore, WA SIG attended an informative briefing by a representative of the Queensland Environmental Protection Agency discussing the concept of the Sustainability Roadmap (WASIG, 2002: 4). This is a helpful framework to assist industry's progress towards sustainability. In a similar vein, WA SIG attended an educational seminar held on the concept of Sustainability Covenants (WASIG, 2003: 4), how they can be used in WA, and what some of the most recent experiences of similar types of covenants in Australia are. In terms of WA-oriented Cleaner Production matters, WA SIG went to a forward-looking forum to discuss opportunities for eco-industrial parks in WA (WASIG, 2002: 3). Here, a refinery synergies project was showcased where there are 105 existing linkages between 26 core processing plants. A pre-feasibility study incorporates industrial ecology principles in identifying the best land use for the land in proximity to a wastewater treatment plant and looks at establishing horticulture, aquaculture, and waste management in the buffer zone, which appeared to be the most feasible solution. Similarly, a case was presented for incorporating industrial

ecology principles (WASIG, 2002: 3) where the development of parks takes into consideration substantial industrial planning, recognising synergistic opportunities, the vision of boundary sharing of outputs, and across-industry environmental monitoring.

### **3.3 Dominance and Regime Facilitation Mode**

The regimes' facilitation of preventative technology transfer was influenced by the preferential behaviour pattern of dominance. UNEP's IDCP and WA SIG's CPS issue-actor compass and issue agenda were shaped by the heavy frequency of prescriptive issue-actor configurations. In terms of regime effectiveness, the enhancing effect of the regimes' respective issue-actor compass on the ability of stakeholders to co-operate in preventative technology transfer was aided by dominance. With regard to regime resilience, the constraining effect of the regimes' respective issue agenda on collective decisions and behaviour in preventative technology transfer was supported by dominance. With prescriptive issue-actor configurations featuring prominently in regime communication, dominance considerably sways the stability of the prevention regimes' action-factor equilibrium towards uni-lateralism in collective decision and action.

## **4 DETACHMENT IN REGIME COMMUNICATION**

In order to establish regime facilitation mode, the regimes' facilitation of preventative technology transfer was researched for an identification of preferential behaviour patterns. The initial hypothesis was that the patterns of detachment, dependence, and dominance all were a factor in UNEP's IDCP and WA SIG's CPS policy action for making collective decisions and behaviour happen in preventative technology transfer. Investigating the regimes' sustainability communication, strong evidence of the preferential behaviour pattern of detachment in the regimes' actor agenda and issue-actor direction was discovered. These processes of the regimes' policy action in preventative technology transfer are moulded by a frequency of designative issue-actor configurations. Here, the regimes' sustainability facilitation is ruled by sustainability issues that are treated as information to be contemplated for action.

### **4.1 Regime Effectiveness and Actor Agenda**

Exploring the regimes' sustainability communication reveals strong evidence supporting the notion of detachment playing a part in the regimes' facilitation of preventative technology transfer. In particular, the data reveal that the heavy frequency of designative issue-actor configurations in multi-stakeholder co-operation is a factor contributing to the regimes' effectiveness in actor agenda setting. The capability of stakeholders to co-operate is boosted to the degree that the roles of actors in the initiatives are made clear. Applying a comparative analysis by actor grouping of UNEP's IDCP and WA SIG's CPS application of sustainability ideas to collective policy formation and conduct as part of the regimes' actor agenda is instructive. It highlights the ways in which the regimes use multi-stakeholder initiatives to encourage preventative technology transfer

flows in production processes, product development, or the provision of services that restrain the generation of detrimental wastes and capitalise on the efficiency of the use of energy and materials.

#### **4.1.1 UNEP's IDCP Actor Agenda**

Over the period studied, UNEP's IDCP formulated a number of actor group specific agendas. These detailed the expectations of governments, businesses, and facilitating organisations for addressing sustainability issues as identified in the regime's communication. They adroitly covered preventative technology transfer flows in production processes, product development, or the provision of services that unequivocally help minimise the generation of harmful wastes and maximise the efficiency of the use of energy and materials. In production processes, IDCP agendas are practical in that they seek the transfer of environmentally sound technology which conserves raw materials, water and energy, eliminates toxic and dangerous raw materials, and/or reduces the quantity and toxicity of all emissions and wastes at source during the production process. Preventative technology transfer in production processes helps minimise waste of energy, water and materials through process improvement, supports the selection of new processes and alterations to existing ones, reduces impacts on the local and global environment, promotes the minimisation of environmental effects of new activities by advanced planning, pushes the implementation of measures necessary to minimise, prevent or eliminate pollution, and makes monitoring easier. In product development, IDCP agendas are sensible in that they seek the transfer of environmentally sound technology which reduces the environmental, health and safety impacts of a product over its entire life cycle, i.e., raw materials extraction, manufacturing, use, and disposal. Preventative technology transfer in production processes assists in product planning with cradle-to-grave

environmental impact assessment, waste avoidance in product manufacture, the use of exported products, and the reclamation, reuse, recycling, and ultimate disposal of products. In the provision of services, IDCP agendas are sensible in that they seek the transfer of environmentally sound technology that incorporates environmental concerns into designing and delivering services. Preventative technology transfer in production processes alleviates the identification of current environmental effects of past usage of facilities as well as present environmental risks of facilities, and helps improve facility and building services, such as heating, ventilation, lighting, refrigeration, air conditioning, hot water, compressed air, and waste disposal systems to air, water, and land.

### **Agenda for governments**

UNEP's encouragement of IDCP government actors to engage in sustainability partnerships can be categorised in terms of three successive phases each raising one main question. The first phase and question involves UNEP's concern to have Cleaner Production included into government policies and projects in general. The regime was practical about continuing the selection and supply of examples of successful integration of Cleaner Production in national or local policy frameworks and deepening work in crucial areas, such as industrial estates where there was the potential for multiplier effects (UNEP, 2001m: 8). In the second phase, the question concerns UNEP looking towards the further reinforcement of government policies and the continuation of projects to create institutions for mainstreaming Cleaner Production. Here, the regime was practical about boosting the institutional, technical, and managerial capability of the National Cleaner Production Centres and expanding the National Cleaner Production Centre network (Töpfer, K., 2002: 3). In the third phase, the question involves UNEP's aim to get governments to assume a leadership role when constructing appropriate

policy frameworks, including economic, regulatory, and social instruments. The regime was matter-of-fact about incorporating Sustainable Consumption and Production into poverty reduction, economic, trade and financing, and social policies and espousing projects on (public) Green Procurement programmes, Triple-Bottom-Line reporting, and Corporate Environmental and Social Responsibility (UNEP, 2004f: 6).

### **Agenda for businesses**

UNEP's initial encouragement of IDCP business actors to engage in sustainability partnerships can be classified in terms of three main areas of concern (UNEP, 1998m: 24-27). First, there was UNEP's interest in the service sector. The work done in Cleaner Production focusing on the manufacturing side of existing production systems was usefully expanded to include the service sector. Second, there was UNEP's attention to spreading the Cleaner Production message and the largely unrealized potential of the customer-supplier relations between multinationals and small-scale operators when doing so. The regime was correct about the need to appreciate the continuing challenge of getting the Cleaner Production essence to more small and medium-sized enterprises, and to develop influence on multinational companies. This can be better achieved by multinationals sharing their experiences with their suppliers and customers and increasing the understanding of the potential of making Cleaner Production benefits more explicit through supply chain relations, but also utilising 'gatekeepers' to reach small and medium-sized enterprises effectively. Third, there was UNEP's focus on the marketing and advertising sectors and on making certain that they are part of the Cleaner Production movement. It is important to involve marketing and advertising sections to make the most of their influence on

consumption behaviour and the expertise that they can bring to improve the marketing of Cleaner Production as a notion per se.

UNEP's subsequent encouragement of IDCP business actors to engage in sustainability partnerships saw the introduction of an additional aspect of value. The regime looks towards support of innovative partnerships, concentrating on those that involve the private sector, forged especially with international and national bodies, between business and civil society and between business and government (UNEP, 2002s: 9). Furthermore, the regime decisively propped up efforts to promote Cleaner Production to small and medium-sized enterprises, in particular through approaches such as Supply Chain Management (Kuhndt, M., Türk, V. & Herrndorf, M., 2004: 40-44; von Geibler, J. & Kuhndt, M., 2002: 63-67), involving trade, contracting, and information and technology transfer. This helped continue the promotion of technology transfer from industrialized or developed countries, whilst acknowledging the potential of local technology development. Finally, UNEP emphasised the more active engagement of business in Sustainable Consumption and Production implementation. The regime was unequivocal about setting up concrete partnerships between the UN and multinational corporations to shore up specific projects in developing countries and large organisations intent on helping small and medium-sized enterprises in the implementation of Sustainable Consumption and Production through the use of instruments, such as the greening of the supply chain (UNEP, 2004f: 6-7). This sensibly included the assistance of business and engineering schools in integrating Sustainable Consumption and Production syllabuses into higher-level education.



### **Agenda for facilitating organisations**

The early stages of UNEP's encouragement of IDCP actors of facilitating organisations to engage in sustainability partnerships saw UNEP focus mainly on building up communication infrastructures. The regime took the practical step of advancing the IDCP and setting up promotional signing ceremonies (UNEP, 1998h: 26-27) by UNEP's Regional Offices and the UNIDO/UNEP National Cleaner Production Centres, using the Philippines Business for the Environment Group as a model for such ceremonies. General guidelines on these events and for the monitoring of the Declaration implementation were developed (UNEP, 1998m: 24-27), and the National Cleaner Production Centres of the Declaration were utilised as an instrument to better act upon the policy recommendation dimensions of their work. The regime took the judicious decision to let UNIDO/UNEP National Cleaner Production Centres and Working Groups, as well as UNEP's regional offices, play a more active role in regional initiatives where they exist, as a closer relationship between the Working Groups and the National Cleaner Production Centres was purposeful, especially when it comes to the National Cleaner Production Centres better employing the services of the Working Groups. This was connected with UNEP's idea about the leadership role it wished to continue playing in developing and guiding National Cleaner Production Centres, both those handled in conjunction with UNIDO and those supported by other partners (UNEP, 2001m: 8). The regime continues to push its catalytic role by creating capacity in other Cleaner Production service providers through National Cleaner Production Centres and providing more guidance material for setting up and running successful National Cleaner Production Centres, with each specialising in a few specific Cleaner Production fields, complemented by access to networks. In Cleaner Production development, promotion, and implementation, the emphasis of the regime appropriately was on the involvement of non-technical stakeholders in Cleaner Production centre work,

such as policy-makers, financial institutions, non-governmental organisations, and the media (UNEP, 2001m: 8).

The later stages of UNEP's encouragement of IDCP actors of facilitating organisations to engage in sustainability partnerships demonstrated a concern by UNEP for a clear multi-stakeholder involvement. The regime supported investments in Cleaner Production and the gaining of greater commitment of the private financial sector. It was crucial to develop the funding of Cleaner Production through local financing institutions as well as multilateral development banks (Tortajada, C., 2004: 11-14), as well as amplify local institutions' capabilities, bolster funding mechanisms, and better target small and medium-sized enterprises and local governments. UNEP also seriously looked towards raising the demand for Cleaner Production-related information by moving beyond information networking to knowledge management and counselling. Improving the context, relevance, and user-friendliness of Cleaner Production information systems with regard to developing countries clearly helps reinforce the National Cleaner Production Centres' capacity for effectual information delivery (UNEP, 2004h: 15-18), but also efforts towards capacity building in Cleaner Production in general. This latter point was highlighted in the regime's adherence to the CPC/NCPC approach, using 'train the trainer' programmes to build Cleaner Production capacity on the part of other professionals and develop a market for Cleaner Production. UNEP's push for capacity building ties in with its efforts to create synergy between Cleaner Production and various multi-lateral environmental agreements (UNEP, 2001n: 20).

As to encouraging sustainability partnerships in terms of content refinement, UNEP's eye was firmly on the reinforcement of the role of National Cleaner Production Centres and similar organizations by expanding the traditional Cleaner

Production focus on processes to also incorporate products and services and tackle poverty reduction and other development goals. The regime took constructive steps to ensure that National Cleaner Production Centres provide their service packages as ‘total solutions’ to their core clients, namely business, and to include instruments. These include Product and Service Design, Life Cycle Management, Corporate Social Responsibility Reporting (Green, R., 2002: 33-36; Kornevall, C., 2002: 30-33; Kuhndt, M., Schäfer, J. & Liedtke, C., 2002: 67-72; Pigott, T., 2004: 25-29), marketing, and access to funding sources. Financial institutions were needed to generate favourable financial conditions and a stable and competitive economic framework for Sustainable Consumption and Production investments. It was therefore consistent for the regime to place maximum weight on partnerships with business and governments furnishing financing programmes for investments in Sustainable Consumption and Production activities, in particular for small and medium-sized enterprises, and to introduce mainstream Green Accounting (UNEP, 2004f: 6-7) for business and governments to internalize environmental costs. Last but not least, UNEP encouraged the expansion of the Sustainable Consumption and Production stakeholder group affiliated to international organisations by engaging intermediary organisations between producers and consumers, in particular in retail and marketing (UNEP, 2004g: 29-33). Partnerships at global and national levels with retailers, distributors, and marketing agencies were helpful in that they allow the collation and assessment of lessons learnt from successful campaigns seeking to change consumer behaviour so as to advance Sustainable Consumption and Production.

#### **4.1.2 WA SIG's CPS Actor Agenda**

Over the period investigated, WA SIG's CPS also framed a number of actor group specific agendas, describing the expectations of governments, businesses, and facilitating organisations for attending to sustainability issues as specified in the regime's communication. As in the case of UNEP's IDCP, the CPS agendas proficiently handled preventative technology transfer flows in production processes, product development, or the provision of services that unambiguously helped minimise the creation of risky wastes and take full advantage of the efficiency of the use of energy and materials. In production processes, CPS agendas sought the transfer of environmentally sound technology that limited pollution. These technologies conserve raw materials, water and energy, eliminate toxic and dangerous raw materials, and/or reduce the quantity and toxicity of all emissions and wastes at source during the production process. This helps curtail waste of energy, water and materials through process upgrading, supports the preference for new processes and adjustments to existing ones, and decreases impacts on the local and global environment. In addition, it fosters the minimisation of environmental consequences of new activities by forward-looking planning, presses on the working of approaches indispensable for curbing, avoiding or abolishing pollution, and makes monitoring more straightforward. In product development, CPS agendas sought the transfer of environmentally sound technology which lessens the environmental, health and safety impacts of a product over its whole life cycle, that is raw materials mining, manufacturing, application, and discarding, thus keeping up product planning with cradle-to-grave environmental impact assessment, waste prevention in product manufacture, the application of exported products, and the reclamation, reuse, recycling, and eventual clearance of products. In the provision of services, CPS agendas sought the transfer of environmentally sound technology which incorporates environmental concerns into designing and delivering services, thus

alleviating the identification of existing environmental effects of former usage of facilities as well as present environmental threats of facilities, and helping upgrade facility and building services, such as heating, ventilation, lighting, refrigeration, air conditioning, hot water, compressed air, and waste disposal systems to air, water, and land.

### **Agenda for governments**

WA SIG's initial encouragement of CPS government actors to engage in sustainability partnerships endeavoured to address its concern to have Cleaner Production included into government policies and initiatives. The regime made a number of practical contributions in this regard. For example, WA SIG undertook a Cleaner Production post-graduate programme (WASIG, 2003: 7) covering the course, a Graduate Certificate and a Professional Certificate, but also training programmes in Cleaner Production for a range of groups, for instance, a three month training programme for local government environmental health officers to enable them to promote Cleaner Production in industry (WASIG, 2000b: 3). What is more, the regime participated in a collaborative effort involving government, business, as well as professional and community associations, which provides training in Cleaner Production policies, practices, and techniques to local government in workshops and to light industry in workshops, self-assessment, and on-site assistance. This is the constructive SRT Clean Swan Accreditation Scheme which recognizes businesses that have done the essential things under their Cleaner Production action plans enabling them to gain gold, silver, or bronze accreditation (WASIG, 2000a: 4).

WA SIG's subsequent encouragement of CPS government actors to engage in sustainability partnerships saw the addition of submissions of recommendations to

government actors in key Cleaner Production questions. For example, the regime provided a productive submission to the WA State Government identifying eight key aspects the State Sustainability Strategy (WASIG, 2002: 4) should address. These were: a meaningful definition of sustainability; evidence for state government leadership; accessible information for business involvement; a role of small and medium enterprises for delivering sustainability; the importance of government procurement; the recognition of global leadership of WA industries; the willingness in the business community to consider sustainability; and sustainability calls for the whole of the government approach. Furthermore, WA SIG co-hosted a seminar to review the recommendations outlined in the State Sustainability Strategy, focusing on how to best address the four key areas of training and facilitation, financing and economic reform, industrial ecology and Eco-Efficiency, and sustainability covenants (WASIG, 2003: 4). As a result, WA SIG provided valuable input, recommending that the State Sustainability Strategy be strategic about sustainability, the framework be correct, the actions that make a difference be taken, Factor 4 be made a reality, and strategy be turned into action. Another key area where WA SIG put in a submission is the WA State Greenhouse Strategy (WASIG, 2002: 4) where WA SIG recommended a five pronged approach be formulated to foster the development and implementation of least cost abatement options around WA. The approach was helpful as it aims to provide clear direction on the undisputable importance of greenhouse gas (GHG) emission reduction, manage and minimise new GHG emission sources, reduce and eliminate current GHG emission sources, create a GHG friendly built environment, and promote the development and commercialisation of GHG abatement technologies.

### **Agenda for businesses**

WA SIG's early encouragement of CPS business actors to engage in sustainability partnerships can be classified in terms of Cleaner Production areas of industry-wide and sector-specific concern. For example, the regime carried out a Cleaner Production post-graduate programme (WASIG, 2000a: 3), but also training programmes in Cleaner Production. Moreover, a number of functional Cleaner Production Clubs were set up which aim at assisting groups of small businesses to develop their own Cleaner Production action plans and monitor and evaluate improvements in environmental performance. For example, WA SIG's Drycleaning Cleaner Production Club (WASIG, 2000a: 3; 2000b: 3) involves 6 local dry-cleaning businesses completing a Cleaner Production programme that involves 5 workshops and the development of Cleaner Production action plans. On average, each business can achieve savings of AU\$6,000 per year through energy efficiency, solvent use efficiency, and a reduction in solvent waste generation. A benchmarking process operates, revealing that the main drycleaning performance statistic of perchloroethylene usage averages between 20 and 75 kg clothing/litre perchloroethylene compared to, for instance, 71 kg/l for similar machines in the UK.

Furthermore, WA SIG engaged in a significant range of more specialised Cleaner Production partnerships. For example, in its industrial energy efficiency workshop, the regime helped to share leading edge practices on energy efficiency in relation to Cleaner Production and Eco-Efficiency with a site tour organised to demonstrate a number of projects implemented to reduce and better manage energy consumption, including innovative management practices, detailed plant wide monitoring systems, and a range of energy efficient technologies. WA SIG also carried out a noteworthy project in conjunction with Homeswest (WASIG, 2001: 3), where waste inventories have been conducted on a number of residential

building sites in Perth and waste notes for each phase of the building process (from design through to external finishing) have been put together from this information in order to develop Cleaner Production Information Sheets for each phase of the process, along with some pilot testing of Cleaner Production initiatives. In terms of the dissemination of sustainability information, the regime enhances WA participation in national initiatives, such as the LCA Tools for Building and Construction and the Mining, Minerals and Sustainable Development videoconference at Curtin University and two other centres (WASIG, 2000a: 4).

WA SIG's later encouragement of CPS business actors to engage in sustainability partnerships saw the addition of more aspect-related and sector-specific Cleaner Production initiatives. For example, apart from its revamped Professional Certificate, Post Graduate Certificate and Masters Cleaner Production programme, the regime provided an instructive training package specifically for businesses (WASIG, 2002: 6). Similarly, in a co-hosted energy efficiency seminar series, WA SIG provided practical and workplace centred solutions to improve energy management and energy efficiency (WASIG, 2003: 5). The first session looked at opportunities in commercial buildings, process efficiency, how to 'walk the talk', and some practical case studies on energy efficiency. The second session provided information on Cleaner Production assessments, energy reviews for business customers, how to establish an energy management programme, and a case study example taking up the greenhouse challenge. Moreover, the regime used a multi-faceted consultancy project with Environment Australia to research and write 13 case studies, providing essential evidence that Eco-Efficiency and Cleaner Production can both save money and reduce environmental impacts (WASIG, 2003: 7). Five case studies were on companies based in Tasmania and two case studies are from each of the four categories of life cycle assessment,



industrial ecology, performance based contracting, and codes of practice. WA SIG also furnished a very practical life cycle assessment for the Grains Research and Development Corporation (WASIG, 2003: 7), where LCA is applied to Broad acre grain production with the aim of assessing the overall environmental improvement opportunities in terms of 'paddock to plate' case studies for bread, cooking oil, and beer.

### **Agenda for facilitating organisations**

WA SIG's original encouragement of CPS actors of facilitating organisations to engage in sustainability partnerships focused on Australia- and world-wide Cleaner Production networking. For example, the regime offered an open Cleaner Production post-graduate programme covering the Masters course, a Graduate Certificate and a Professional Certificate accredited through Curtin University. In addition, WA SIG developed useful links with the World Business Council for Sustainable Development (WBCSD), which consists of 28 partner organisations of the WBCSD and 154 members, including BHP, WMC, Fletcher Challenge, and Western Power Corporation (WASIG, 2000a: 6). As a member of the WBCSD (WASIG, 2000a: 6), WA SIG contributed to and is expert adviser on Task Forces of the WBCSD and was observer at Members business meetings. WA SIG benefited from networking with WBCSD through access to work in progress and an opportunity to share WA experience and practice. However, WA SIG's commitment to participate and contribute was at WA SIG's own cost which needed to be met by developing a sponsorship arrangement whereby several organisations would contribute a total of AU\$10,000 to AU\$15,000 per year to facilitate WA SIG's attendance at Task Force or Member meetings in exchange for, for instance, exposure for and to WBCSD Members.

WA SIG's ensuing encouragement of CPS actors of facilitating organisations to engage in sustainability partnerships saw the addition of a WA sustainability focus. The regime offered a revamped version of its open Professional Certificate, Post Graduate Certificate and Masters Cleaner Production programme (WASIG, 2003: 7). As a founding partner in the non-governmental sustainability association of WA Collaboration (WASIG, 2003: 6-7), WA SIG assisted with the development of this helpful partnership with some of WA's leading non-government organisations joining forces to help shape and promote the sustainability agenda for WA. As a newly developed platform for dialogue on the business contribution to sustainable development, WA SIG supported WA Collaboration in its aim to evolve likewise into a platform for dialogue on the community's contribution to sustainable development in WA (WASIG, 2003: 6). The regime assumed a constructive role in the dialogue of WA Collaboration, encouraging consideration of industry best practice in dealing with sustainable development challenges, locally and globally, and reporting on a community-networking Sustainability Summit, for the first time bringing together people from all perspectives of the non-government and community sector to find common ground on sustainability and create networks and partnerships for the future (WASIG, 2003: 7).

## **4.2 Regime Resilience and Issue-Actor Direction**

As with the regimes' effectiveness in the setting of the actor agenda, the data demonstrate that the frequency of designative issue-actor configurations in multi-stakeholder co-operation is also a factor contributing to the regimes' resilience in issue-actor direction. Collective decisions and behaviour in later periods of the regime history were constrained to the extent that actors performed

within the frameworks constructed for them. A consideration and exploration from a dynamic perspective of the regimes' application of three multi-stakeholder facilitation strategies for the development of sustainability partnerships in preventative technology transfer is informative in terms of strategy performance and linkages. The facilitation strategies used by the regimes in the development of sustainability facilitation issues can be categorised in terms of the regimes' intra-institutional as well as inter-institutional preventative technology transfer through internal consultation, preventative technology transfer through external consultation, and preventative technology transfer through education and training.

Analysis of UNEP's IDCP and WA SIG's CPS action on policy definition with respect to formulating and executing multi-stakeholder partnership strategies revealed a number of important changes that the regimes went through. These involved the setting of preventative sustainability facilitation policy goals, the design of a package of policy management responses appropriate for achieving these policy goals, and the selection of methods, such as command and control, incentives, or persuasion, for implementing those institutional responses. For example, policy goals for managing the preventative sustainability facilitation hazards are spelled out in a particular way. Moreover, approaches regarding reduction or prevention of the causes responsible for the sustainability facilitation hazards are specified in a certain manner. Furthermore, approaches regarding adaptation or adjustment to the impacts of the sustainability facilitation hazards are stipulated in a specific fashion.

#### **4.2.1 Policy Definition and Regime Action**

The focus of this comparative section is on UNEP's IDCP and WA SIG's CPS sustainability facilitation action on policy definition. The two issues of internal

and external sustainability facilitation were investigated with respect to the three facilitation strategies of preventative technology transfer through internal consultation, external consultation, and education and training. Specific example areas of the regimes' sustainability facilitation performance were considered before reflecting on the regimes' general performance patterns and contemplating improvements over time in the regimes' facilitation performance. The spotlight is on a number of key aspects in the management of preventative sustainability facilitation. For example, the relevance of the regimes' sustainability policy to their signatories' activities, products, or services is of interest. Moreover, the replication of the regime's values and guiding principles in the individual sustainability policy is significant. Furthermore, the support of the regimes' sustainability policy in terms of the signatory actors' development and inclusion of sustainability practices is important.

### **UNEP's IDCP and WA SIG's CPS internal sustainability action**

UNEP's IDCP and WA SIG's CPS were both committed to achieving effective policy objectives and targets as part of their internal sustainability facilitation interests. The facilitation objectives of UNEP's IDCP and WA SIG's CPS sustainability interests generally aimed at initiating or carrying on effective sustainability communication. The facilitation targets of the regimes by and large sought to produce the greatest possible degree of effectiveness in the instigation or continuation of sustainability communication whenever and wherever possible.

#### *Experience sharing and multi-stakeholder partnership strategy*

UNEP and WA SIG ensured that the IDCP and CPS actors were supported by a regime sustainability policy that was relevant to signatories' activities, products,

or services, and that the IDCP and CPS actors' sustainability policy reflected the regime's values and guiding principles. While it is not always clear to what extent IDCP and CPS actors were guided towards actually monitoring appropriate sustainability technology and management practices, the regime sustainability policy, nonetheless, was carried by the top management of IDCP and CPS actors who allowed the regime sustainability policy to assist them in developing and including sustainability practices as well as guide them in setting sustainability objectives and targets. An example illustrating this is found in UNEP's facilitation objective to develop a professional exchange of ideas with and among IDCP actors by pushing the definitional boundaries of Cleaner Production. Here, the regime was constructive in concentrating on developing IDCP actors' awareness of opportunities for sustainability practices as regards preventative technologies (Kornevall, C., 2002: 30-33; UNEP, 1998k: 25, 2002g: 8, 2002l: 22-23). Similarly, WA SIG aimed at developing CPS actors' awareness in particular as pertaining to preventative technologies that minimise the generation of harmful wastes and maximise the efficiency of the use of energy and materials. Here, it is commendable that WA SIG did not restrict itself to one field or sector, but rather ran the whole gamut. For instance, the Cleaner Production topic of energy efficiency and waste minimisation was addressed (WASIG, 2001: 2).

*Dialogue with interested parties and multi-stakeholder partnership strategy*

UNEP and WA SIG made certain that the IDCP and CPS actors were supported by a regime sustainability policy that guided the IDCP and CPS actors' setting of sustainability objectives and targets. An instance of this is UNEP's development of the International Declaration on Cleaner Production (IDCP) to catalyse commitment from different stakeholders for the promotion and facilitation of Cleaner Production and Sustainable Consumption. UNEP endeavoured to build on

the work of the OECD in developing 'basic capacity level' on the subject of Cleaner Production in the Central and Eastern European countries and Newly Independent States (UNEP, 1998q). In this connexion, the regime aimed to measure the progress of these regional institutions against six major success criteria. Likewise, there was WA SIG's development of a West Australian Cleaner Production Statement (WACPS) to secure commitment from different stakeholders for the endorsement and progress of Cleaner Production and Eco-Efficiency (WASIG, 2005).

*Education and training and multi-stakeholder partnership strategy*

UNEP and WA SIG made sure that the IDCP and CPS actors were supported by a regime sustainability policy that IDCP and CPS actors were guided towards developing and monitoring appropriate sustainability technology and management practices. An instance of this was UNEP's and CPS's diffusion of Cleaner Production principles and practices. The regimes engaged in a wide variety of actor- or sector-specific research projects involving the development and dissemination of applicable sustainability information. For example, UNEP called for building capacity at the local level, including local authorities, entrepreneurs, and banks, in order to develop sustainable systems taking into account local resource availabilities and energy requirements (Hanks, J., 2004: 36-40; Kato, S., 2004: 35; Milford, L. & Schumacher, A., 2004: 18-20; UNEP, 2004h: 15-18). WA SIG focused on continual improvement, prevention of pollution, sustainability monitoring, the meeting or exceeding of legal or other sustainability requirements, and consideration of the sustainability expectations of interested parties. An instance was WA SIG's Cleaner Production postgraduate programme (WASIG, 2003: 7), but also training programmes in Cleaner Production for a range of groups.

### **UNEP's IDCP and WA SIG's CPS external sustainability action**

The IDCP and CPS were both devoted to achieving effective policy objectives and targets as part of their external sustainability facilitation interests. The facilitation objectives of the regimes' sustainability interests generally aimed at initiating or carrying on effective sustainability communication. The facilitation targets of the regimes as a rule endeavoured to produce the greatest possible degree of effectiveness in the instigation or continuation of sustainability communication whenever and wherever possible.

#### *Experience sharing and multi-stakeholder partnership strategy*

UNEP and WA SIG ensured that the IDCP and CPS actors were assisted in developing and including sustainability practices. An instance of this was UNEP's and WA SIG's efforts to develop a professional exchange of ideas with external stakeholders through policy dialogue focusing on Cleaner Production. The regime's efforts aim at promoting and developing its International Declaration of Cleaner Production (UNEP, 1998h: 26-27). In the process, UNEP looked at specifying the more substantive content that Cleaner Production could give to the concept of continual improvement (UNEP, 1998a: 18-19, 2002n: 21; Yamada, Y. & Parasnis, M., 2002: 55-60). UNEP also undertook to facilitate synergies between Cleaner Production and multi-lateral environmental agreements (Bakken, P., 2001: 54-55; UNEP, 2001n: 20, 2002c: 17-21). Similarly, WA SIG aimed at promoting and developing its West Australian Cleaner Production Statement. Potential signatories were made aware that WA SIG advocates Cleaner Production and Eco-Efficiency (WASIG, 2005).

*Dialogue with interested parties and multi-stakeholder partnership strategy*

UNEP and WA SIG pursued the development of a constructive exchange of ideas with international stakeholders taking an active interest in Cleaner Production. The regimes' main objective was to secure a Cleaner Production orientation in stakeholder policies, planning, and initiatives. For example, UNEP supported efforts to set up partnerships with advertising agencies and the media to investigate initiatives for the integration of Sustainable Consumption and Production into the messages conveyed to consumers (Anderson, D., 2001: 3; Pigott, T., 2004: 25-29; UNEP, 1998i: 15-16, 2001p: 19-23), and to mobilise icons, such as sport stars and artists, to help impart Sustainable Consumption as a 'cool' lifestyle, including sports and leisure perspectives. Similarly, WA SIG touched base with a great variety of sustainability initiatives and followed them up. One such initiative was UNEP's Cleaner Production programme, which looked into new sustainability trends and challenges, such as moves to the diffuse sources of pollution; the spread of mainstreaming in the business management approach; and the encouragement of cleaner and safer production in small to medium enterprises (WASIG, 2000a: 3).

*Education and training and multi-stakeholder partnership strategy*

UNEP and WA SIG made sure the development and inclusion of sustainability practices into stakeholders' sustainability policy. An instance of this was UNEP's and WA SIG's efforts to support the diffusion of Cleaner Production principles and practices. UNEP demanded continuous improvement through better practices to be instituted as a more realistic model for accomplishing a switch to sustainable agriculture, rather than the direct adoption of best practices. The regime endeavoured to bolster the transfer of established sustainable agriculture practices,



stressing the process for adopting these, and to collaborate with governments to present incentives for producers or farmers to commence the transition, but also to acquire financing means to assist companies in the change-over period (UNEP, 2004f: 6-7). WA SIG engaged in a number of collaborative sustainability research projects (WASIG, 2003: 7).

#### **4.2.2 Policy Definition and Patterns of Regime Learning**

A performance pattern can be discerned in UNEP's IDCP and WA SIG's CPS sustainability facilitation activities. This performance pattern is common to all three of the regimes' facilitation interests, namely sustainability communication through experience sharing, through dialogue with interested parties, and through education and training. However, there are nuances in the regimes' performance of activity interests depending on whether they were realised as part of the individual regime's internal or external sustainability policy.

#### **UNEP's IDCP and WA SIG's CPS internal and external sustainability action**

Both the IDCP and CPS define their internal and external sustainability facilitation policy and ensure commitment to it. In the definition of the regimes' internal sustainability facilitation policy, the ongoing commitment and leadership of the top management of signatory actors are judged decisive. In order to ensure the success of their internal and external sustainability facilitation policy, the regimes took steps early on to obtain commitment from the top management of signatory actors to improve the sustainability management of their activities, products, or services.

The preliminary position of a (future) IDCP or (future) CPS actor with regard to sustainability can be established by means of an initial sustainability review. UNEP's and WA SIG's initial reviews covered a range of relevant sustainability questions. These included the identification of legislative and regulatory requirements for sustainability, and the detection of sustainability interests in relation to the activities, products, or services of (future) actors, so as to determine those that have or can have significant sustainability implications. In addition, account was taken of the evaluation of sustainability performance of (future) actors compared with relevant internal criteria, external standards, regulations, codes of practice, and sets of principles and guidelines, and the sighting of existing sustainability management practices and procedures applied by (future) actors. But also the identification of opportunities for competitive advantage in sustainability, the consideration of views of interested parties, as well as the sighting of functions or activities of (future) actors who can enable or impede sustainability performance was incorporated.

UNEP and WA SIG reviewed a number of important sustainability areas. These embraced institution activities, specific operations, or the specific site of a (future) IDCP or (future) CPS actor. The regimes used some common techniques for conducting the sustainability review, including questionnaires, interviews, checklists, and benchmarking for studying best practices to enable IDCP or CPS actors to improve on their sustainability performance. UNEP and WA SIG consulted a number of outside sources, such as government agencies in relation to laws and permits, local or regional libraries or databases, other organisations for exchange of information, industry associations, larger customer organisations, manufacturers of equipment in use, business relations (for example, with those who transport and dispose of waste, etc.), and professional help.

Both UNEP's and WA SIG's individual internal and external sustainability facilitation policy established an overall sense of direction and fixed the principles of action for IDCP or CPS actors. The regimes set the goal as to the level of sustainability responsibility and performance required of IDCP or CPS actors, against which all subsequent actions are judged. UNEP and WA SIG used the guiding principles of international organisations, including government agencies, industry associations, and citizens' groups to help IDCP or CPS actors define the overall scope of their commitment to sustainability and give different IDCP or CPS actors a common set of values. The regimes ensured that the responsibility for setting the sustainability policy of IDCP or CPS actors rests with the top management which is responsible for implementing the policy and for providing input to the formulation and modification of UNEP's or WA SIG's sustainability policy.

#### **4.2.3 Policy Definition and Regime Learning Performance**

In both their internal and external sustainability facilitation policy, UNEP's IDCP and WA SIG's CPS both engaged in a thorough and continual execution of effective actions to realise sustainability partnerships in the regimes' main facilitation interests, namely sustainability communication through experience sharing, through dialogue with interested parties, and through education and training.

#### **UNEP's IDCP and WA SIG's CPS internal and external sustainability action**

UNEP's IDCP and WA SIG's CPS defined their internal and external sustainability facilitation policy and ensured commitment. The regimes commenced in areas where the promotion of sustainability is evident, namely in

sustainability communication through experience sharing, dialogue with interested parties, and education and training. The regimes' internal and external sustainability facilitation policy considered the (future) IDCP or (future) CPS actor's mission, vision, core values, and beliefs, any requirements of and communication with interested parties, continual improvement, guiding principles, and any co-ordination with other institutional policies of the IDCP or CPS actor (for instance, quality, occupational health and safety, etc.). But also specific local or regional conditions, and compliance with relevant sustainability regulations, laws, as well as other criteria to which the (future) IDCP or (future) CPS actor subscribes. UNEP and WA SIG used sustainability performance evaluation procedures and associated indicators in their individual internal sustainability facilitation policy to assist IDCP or CPS actors in minimising any significant adverse sustainability implications of new developments in their sustainability policy definition and commitment.

In the regimes' internal and external policy definition process, it is sustainability communication through experience sharing, through dialogue with interested parties, and through education and training that constitute the regimes' three activity interests. These were addressed directly, and the preventative sustainability facilitation hazards identified in terms of these interests were managed in a non-circuitous fashion. Hazard acceptance was not an option in the regimes' hazard management approach. Neither was there adjustment in the sense of adaptation to the consequences of sustainability facilitation hazards. Nor was hazard spreading as in the introduction of insurance-type plans for that matter. Reduction or prevention of the causes of preventative sustainability facilitation hazards was the regimes' main policy goal throughout. Both, UNEP and WA SIG used the insights gained in any of the three activity interests to inform the regimes' policy management choices. As the regimes grew in experience,

procedures, programmes, and technologies were put in place to further improve preventative sustainability performance of signatory actors. As UNEP and WA SIG matured, preventative sustainability considerations were integrated more and more into operational decisions of signatory actors.

#### **4.2.4 Policy Planning and Regime Action**

As with the regimes' resilience in policy definition issue-actor direction, the data discussed below demonstrate that the frequency of designative issue-actor configurations in multi-stakeholder co-operation was also a factor upholding the regimes' resilience in policy planning issue-actor direction. Collective decisions and behaviour in later periods of the regime history were constrained to the extent that actors operated on the basis initially outlined for them. A consideration and exploration from a dynamic perspective of the regimes' application of three multi-stakeholder facilitation strategies for the development of sustainability partnerships in preventative technology transfer is revealing. The facilitation strategies employed by the regimes in the development of sustainability facilitation issues can be grouped in terms of the regimes' intra-institutional as well as inter-institutional preventative technology transfer through internal consultation, through external consultation, and through education and training.

Analysis of UNEP's IDCP and WA SIG's CPS action on policy planning with regard to formulating multi-stakeholder partnership strategies exposes several changes the regimes underwent. These covered the broad area of understanding the nature, causes, consequences, likelihood, and timing of the sustainability facilitation hazards. For example, a certain way of characterising a particular sustainability facilitation hazard became established at a specific stage. Moreover, debates about characterisations were resolved at a particular point in time.

Furthermore, innovations in characterisations and estimations originate from a specific source. The changes occurring in the selection of possible response options, including the likely effectiveness and costs of such options, are relevant here. These involved technological, organisational, or behavioural measures that a regime undertook to help manage a sustainability facilitation hazard. For example, the regimes consider specific options for changing the causes thought to underlie sustainability facilitation hazards, expecting associated costs and benefits. Moreover, the regimes contemplate policy response options for changing sustainability in ways that directly counter the effects of causes, thinking certain costs and benefits likely. Furthermore, policy response options are pondered by each regime for adapting to the sustainability changes associated with facilitation hazards, supposing specific costs and benefits.

The focus of this comparative section is on UNEP's IDCP and WA SIG's CPS sustainability facilitation action on policy planning. The two issues of internal and external sustainability facilitation were examined with regard to the three facilitation strategies of preventative technology transfer through internal consultation, external consultation, and education and training. Specific example areas of the regimes' sustainability facilitation performance were contemplated before proceeding to ponder the regimes' general performance patterns and consider improvements over time in the regimes' facilitation performance. The focus is on the evaluation of key aspects in the management of preventative sustainability facilitation. For example, whether the regimes helped ascertain the sustainability interests of signatory actors' activities, products, or services is important. Moreover, the regimes' support of signatory actors in establishing any significant adverse sustainability implications associated with their activities, products, or services is important. Furthermore, the regimes' procedure for

evaluating the sustainability implications of signatory actors' projects is significant.

### **UNEP's IDCP and WA SIG's CPS internal sustainability action**

Both regimes were dedicated to achieving effective policy objectives and targets as part of their internal sustainability facilitation interests. The facilitation objectives of the IDCP and CPS sustainability interests sought to initiate or carry on effective sustainability communication. The facilitation targets of the regimes, by and large, were devised to produce the greatest possible level of effectiveness in the launch or extension of sustainability communication.

#### *Experience sharing and multi-stakeholder partnership strategy*

UNEP and WA SIG made certain that IDCP and CPS actors determined the significant sustainability interests, considering implications, likelihood, severity and frequency. An instance of this was UNEP's and WA SIG's endeavour to develop a professional exchange of ideas with and among IDCP actors by pushing the definitional boundaries of Cleaner Production. In order to achieve this, UNEP concentrated on developing IDCP actors' awareness of opportunities for sustainability practices (Kornevall, C., 2002: 30-33; UNEP, 1998k: 25, 2002g: 8, 2002l: 22-23), using a two-pronged approach. On the one hand, UNEP generally stressed the importance of focusing on consolidating existing successes rather than embarking on any major new initiatives (UNEP, 2001o: 11-12), acknowledging that Cleaner Production has moved out of its early growth phase. Thus, the regime felt the need to ensure that partnership approaches that have been introduced are supported and sustained rather than having new ones instituted which may reduce the support services available to the status quo

(Huisinigh, D., 2002: 48-51; UNEP, 2002e: 17). On the other hand, UNEP wished to propel the IDCP beyond the initial signing by advancing the Declaration through deepened co-operation of UNEP and its partners in facilitating the Declaration's implementation (UNEP, 1998h: 26-27). Similarly, WA SIG included the Cleaner Production topic of waste management, as illustrated by the waste disposal facility that exhibits efficient waste acceptance and separation techniques. There was also the Cleaner Production question of waste reduction, as demonstrated by the centre consisting of an education base, a materials recovery facility, a Bedminster in vessel composting facility, and a green waste processing facility, which reduces waste to landfill by 85% (WASIG, 2003: 3-4).

*Dialogue with interested parties and multi-stakeholder partnership strategy*

UNEP ensured that IDCP actors were assisted in accessing, identifying, and keeping track of changes to legal and other sustainability requirements. An instance of this was UNEP's development of the International Declaration on Cleaner Production (IDCP) to catalyse commitment from different stakeholders for the promotion and facilitation of Cleaner Production and Sustainable Consumption. Considering itself an 'impartial' inter-governmental agency that is well-placed to ensure the co-ordinated preparation of clear Cleaner Production goals and approaches, the regime pursued the realisation of the potential of the mutually reinforcing ISO 14001 and the Cleaner Production approach (UNEP, 1998j: 21-23, 2001f: 24). Similarly, WA SIG ensured that CPS actors identified sustainability objectives and targets that reflect both the sustainability policy and the significant sustainability implications associated with their activities, products, or services. An instance of this was WA SIG's development of a Western Australian Cleaner Production Statement (WACPS) to catalyse commitment from different stakeholders for the promotion and facilitation of Cleaner Production



and Eco-Efficiency (WASIG, 2005). The regime's efforts aimed at engaging current and future stakeholders to work towards the realisation of the objectives and outcomes of the Statement and continue promoting the Statement, with WASIG acting as a register of what had been done in implementing Cleaner Production actions (WASIG, 2002: 4).

*Education and training and multi-stakeholder partnership strategy*

UNEP made sure that IDCP actors were supported in their efforts to regularly review and revise objectives and targets to reflect desired improvements in sustainability performance. An instance of this was UNEP's diffusion of Cleaner Production principles and practices. The regime engaged in a wide variety of actor- or sector-specific research projects involving the development and dissemination of applicable sustainability information. For example, UNEP embarked on the collation of best practice examples and propagation of information on new business opportunities in design and product service systems (McInnes, G., 2002: 92-96; UNEP, 1998d: 20), and the development and spreading of training and networking instruments (Hay, J. E., 2002: 72-75), including Life Cycle Assessment (Pommez, P., 2002: 39-41; UNEP, 2001q: 37-40, 2002g: 8, 2002q: 22-23, 2002r: 38, 2002u: 20), but also the fostering of a voluntary initiative for the advertising industry (UNEP, 2001f: 24), and the promotion of participation in stakeholder discourse to engender a world-wide vision for sustainable consumption. Similarly, WASIG ensured that CPS actors address the problem of resources, responsibility, timing and priority. An instance of this was WASIG's diffusion of Cleaner Production principles and practices. The regime engaged in a number of collaborative sustainability research projects (WASIG, 2003: 7).

### **UNEP's IDCP and WA SIG's CPS external sustainability action**

The IDCP and CPS were both dedicated to achieving effective policy objectives and targets as part of their external sustainability facilitation interests. The facilitation objectives of these sustainability interests generally intended the initiation or maintenance of effective sustainability communication. The facilitation targets of the regimes on the whole attempted to produce the greatest possible extent of effectiveness in the establishment or continuation of sustainability communication.

#### *Experience sharing and multi-stakeholder partnership strategy*

UNEP made certain that stakeholders identify sustainability objectives and targets that reflect both the sustainability policy and the significant sustainability implications. The regime's efforts aimed at promoting and developing its International Declaration of Cleaner Production (UNEP, 1998h: 26-27). In the process, UNEP utilised existent information compilation and distribution instruments (for instance, Internet) rather than creating new ones (UNEP, 1998f: 20, 1998g: 18). The regime's main aim was the continuation of its role as a global facilitator, coordinating with other sustainability initiatives, such as the UNEP-Global Environment Facility (GEF) funding sustainability projects and the Sustainable Alternatives Network (SANet) (UNEP, 2002v: 19). Similarly, WA SIG ensured that stakeholders establish specific measurable indicators for objectives and targets and regularly review and revise objectives and targets to reflect desired improvements in sustainability performance. The regime's efforts concentrated on endorsing and extending its Western Australian Cleaner Production Statement. For example, potential signatories were made aware that CPS signatories endorse the Cleaner Production Statement and WA SIG Charter.

WA SIG also emphasised its role in assisting signatories with the development and implementation of the Action Plan, compiling case studies, providing the framework for the annual report, and publicising the signatory for its support and actions (WASIG, 2004: 3).

*Dialogue with interested parties and multi-stakeholder partnership strategy*

UNEP and WA SIG ensured that stakeholders determined the significant sustainability interests. An instance of this was UNEP's and WA SIG's development of a constructive exchange of ideas with international stakeholders taking an active interest in Cleaner Production. For example, UNEP supported devising economic and political frameworks, at the national, regional, and international levels, which contribute to the adoption of Cleaner Production, the endorsement of the IDCP, and the acquisition of further sustainability commitments (UNEP, 2001c: 23). Similarly, WA SIG made contact with a great variety of sustainability initiatives and carried them on. One such initiative was WA SIG's connection with other Cleaner Production stakeholders in Australia at local, state, and national level. WA SIG looked into funding programmes for Sustainable Development. In a specific energy initiative, WA SIG considered stakeholder engagement to create conditions for change; and management of mineral wealth in terms of costs and benefits of development and capacity to promote sustainable economic development; as well as capacity of industry-based initiatives to promote sustainable development (WASIG, 2001: 2).

*Education and training and multi-stakeholder partnership strategy*

UNEP and WA SIG made sure that stakeholders regularly reviewed and revised objectives and targets to reflect desired improvements in sustainability

performance. An instance of this was UNEP's and WA SIG's diffusion of Cleaner Production principles and practices. In this context, the regimes engaged in a number of collaborative sustainability projects. One theme that was particularly important to UNEP was the education curricula on energy development and management, with a particular focus on business schools. Similarly, WA SIG engaged in training programmes in Cleaner Production (WASIG, 2003: 7).

#### **4.2.5 Policy Planning and Patterns of Regime Learning**

UNEP's IDCP and WA SIG's CPS sustainability facilitation activities display a performance pattern which is common to all three of the regimes' facilitation interests. Depending on whether they were realised as part of the individual regime's internal or external sustainability policy, there are fine distinctions in the regimes' performance of activity interests.

#### **UNEP's IDCP and WA SIG's CPS internal and external sustainability action**

The regimes formulated plans to fulfil their internal and external sustainability facilitation policy. They ensured that signatory actors' sustainability policy, objectives and targets were based on knowledge about the sustainability interests and significant sustainability implications associated with their activities, products, or services. In setting the sustainability objectives, the significant sustainability implications associated with these interests were taken into account by signatory actors. Both UNEP and WA SIG deemed the identification of sustainability interests to be an ongoing process that determines the past, current and potential (positive or negative) implications of signatory actors' activities for sustainability. The regimes' processes covered the identification of the potential regulatory, legal and business exposure affecting signatory actors, as well as the

identification of health and safety implications and sustainability hazard management.

The regimes helped IDCP and CPS signatories to maintain regulatory compliance. IDCP and CPS actors identify and understand regulatory requirements applicable to their activities, products, or services. UNEP and WA SIG assisted with regulations specific to the IDCP or CPS actor's activity (for instance, site operating permits, etc.), the actor's products, or services, the actor's industry, general environmental laws, authorisations, licenses and permits. The regimes used several sources to identify relevant regulations and ongoing changes, including all levels of government, industry associations or groups, commercial databases, and professional services. To facilitate keeping track of legal requirements, IDCP and CPS actors were encouraged to establish and maintain a list of all laws and regulations pertaining to its activities, products, or services.

The regimes assisted IDCP and CPS signatories with establishing internal performance criteria in the sustainability areas of employee responsibilities, acquisition, property management and divestiture, suppliers, contractors, product stewardship, sustainability communication, regulatory relationships, sustainability incident response and preparedness, sustainability awareness and training, sustainability measurement and improvement, process risk reduction, prevention of pollution and resource conservation, capital projects, process change, hazardous material management, waste management (Erkman, S. & Ramaswamy, R., 2001: 64-67; Kato, S., 2004: 35), water management, air quality management, energy management, and transportation.

The regimes supported IDCP and CPS signatories in setting sustainability objectives. These included commitments of IDCP and CPS actors to design

products to minimise their sustainability implications in production, use and disposal, minimise any significant adverse sustainability implications of new developments, and promote sustainability awareness among employees and the community. In order to measure progress towards an objective, IDCP and CPS actors used sustainability performance indicators, such as efficiency of material and energy use or investment in sustainability promotion.

#### **4.2.6 Policy Planning and Regime Learning Performance**

In both their internal and external sustainability facilitation action, UNEP's IDCP and WA SIG's CPS both engaged in a systematic and constant execution of effective actions to attain preventative sustainability partnerships in the regimes' main facilitation interests of sustainability communication through experience sharing, through dialogue with interested parties, and through education and training.

#### **UNEP's IDCP and WA SIG's CPS internal and external sustainability action**

UNEP and WA SIG dealt with the identification of preventative sustainability interests and the evaluation of associated preventative sustainability implications in a continuous process covering four steps. First, there was the selection of a (future) IDCP or (future) CPS actor's activity, product or service. Second, the identification of preventative sustainability interests with regard to the (future) actor's activity, product or service. Third, the identification of preventative sustainability implications associated with each identified interest. Last, the evaluation of the significance of the preventative sustainability implications. UNEP's and WA SIG's evaluation considered preventative sustainability implications in terms of their scale, severity, probability of

occurrence, and duration, as well as with regard to institutional corollaries, such as the IDCP or CPS actor's potential regulatory and legal exposure, difficulty of changing the implication, cost of changing the implication, effect of change on other institutional activities and processes, interests of interested parties, and effect on the IDCP or CPS actor's public image.

UNEP and WA SIG viewed the relationship between internal or external preventative sustainability interests and internal or external preventative sustainability implications as one of cause and effect. A preventative sustainability interest is considered to be an element of a (future) IDCP or (future) CPS actor's activity, product or service which can have a beneficial or adverse implication for preventative sustainability, with a preventative sustainability implication being the change that is likely to take place in preventative sustainability if the interest were actualized. The regimes ensured that IDCP or CPS actors established and maintained procedures to identify, have access to, and understand legal and other preventative sustainability requirements to which they subscribe and which are directly attributable to the preventative sustainability interests pertaining to their activities, products, or services.

UNEP and WA SIG also developed and implemented internal sustainability priorities and criteria where external standards did not meet the needs of IDCP or CPS actors or are non-existent. Together with external standards, the regime's internal sustainability performance criteria assisted IDCP or CPS actors in developing their own sustainability objectives and targets. Furthermore, the regimes helped IDCP or CPS actors establish sustainability objectives to meet their sustainability policy. These objectives were the overall goals for sustainability performance identified in the sustainability policy. When establishing its objectives, an IDCP or CPS actor was expected to take into

account the relevant findings from sustainability reviews and the identified sustainability interests and associated sustainability implications. Preventative sustainability targets could then be set to achieve these objectives within a specified time-frame. The targets were specific and measurable. When the objectives and targets were set, the IDCP or CPS actor considered establishing measurable sustainability performance indicators. These indicators served as the basis for a sustainability-performance evaluation system and provided information on the IDCP or CPS actor's sustainability management. Sustainability objectives and targets applied broadly across the IDCP or CPS actor's institution or more narrowly to site-specific or individual activities. The sustainability objectives and targets were defined by appropriate levels of the IDCP or CPS actor's management. Sustainability objectives and targets were also regularly reviewed and revised, and took into account the views of interested parties.

### **4.3 Detachment and Regime Facilitation Mode**

The regimes' facilitation of preventative technology transfer was influenced by the preferential behaviour pattern of detachment. UNEP's IDCP and WA SIG's CPS actor agenda and issue-actor direction were shaped by the heavy frequency of designative issue-actor configurations. In terms of regime effectiveness, the enhancing effect of the regimes' respective actor agenda on the ability of stakeholders to co-operate in preventative technology transfer was assisted by detachment. With regard to regime resilience, the constraining effect of the regimes' respective policy definition and planning issue-actor direction on collective decisions and behaviour in preventative technology transfer was sustained by detachment. With prescriptive issue-actor configurations featuring markedly in regime communication, detachment greatly leans the stability of the



prevention regimes' action-factor equilibrium towards uni-lateralism in collective decision and action.

## **5 DEPENDENCE IN REGIME COMMUNICATION**

In order to establish regime facilitation mode, the regimes' facilitation of preventative technology transfer was inspected for preferential behaviour patterns. The preliminary hypothesis was that the patterns of detachment, dependence, and dominance all contributed to UNEP's IDCP and WA SIG's CPS policy action for bringing about collective decisions and behaviour in preventative technology transfer. Looking carefully at the regimes' sustainability communication, strong evidence of the preferential behaviour pattern of dependence in the regimes' issue-actor direction was located. This is due to the heavy frequency in these processes of the regimes' sustainability facilitation policy action of appraisive issue-actor configurations where particular sustainability issues are selected as the preferred choice.

### **5.1 Regime Effectiveness and Issue-Actor Direction**

The regimes' sustainability communication displayed strong evidence supporting the notion of dependence being a factor in the regimes' facilitation of preventative technology transfer. Specifically, the information shows that the modest frequency of appraisive issue-actor configurations in multi-stakeholder co-operation plays a role in the regimes' effectiveness in policy measurement issue-actor direction. The capacity of stakeholders to co-operate is upgraded to the point that actors are afforded mechanisms of self-assessment in sustainability performance which they can make use of. A deliberation and investigation from a dynamic perspective of the regimes' application of three multi-stakeholder facilitation strategies for the development of sustainability partnerships in preventative technology transfer is enlightening. The facilitation strategies taken up by the regimes in the development of sustainability facilitation issues can be

classified in terms of the regimes' intra-institutional as well as inter-institutional preventative technology transfer through internal consultation, external consultation, and education and training.

Analysis of UNEP's IDCP and WA SIG's CPS action on policy measurement with respect to multi-stakeholder partnership strategies unveils the development of the regimes' efforts to reflect on and evaluate their own and others' performance in contributing to the management of sustainability facilitation hazards by reviewing key aspects in the management of sustainability facilitation pertinent to the regimes attempts to ensure that signatory actors' sustainability performance was regularly monitored. For example, the measurements were either made by experts, corporate actors, journalists, or politicians or by combinations of these actor groups. Moreover, the measurements targeted particular actors or actor groups, attempted at particular levels and with a defined scope and had purposes that underlie them and factors that prompt. Furthermore, there was reflection on the roles actually played by various stakeholders in the sustainability facilitation hazard management process.

### **5.1.1 Policy Measurement and Regime Action**

The focus of this comparative section is on UNEP's IDCP and WA SIG's CPS sustainability facilitation action on policy measurement. The two issues of internal and external sustainability facilitation were examined with regard to the three facilitation strategies of preventative technology transfer through internal consultation, external consultation, and education and training. Specific example areas of the regimes' sustainability facilitation performance were considered before an assessment of the regimes' general performance patterns was made and improvements over time in the regimes' facilitation performance were considered.

The focus is on the evaluation of key aspects in the management of preventative sustainability facilitation. For example, UNEP and WA SIG support of signatory actors' efforts to establish specific preventative sustainability performance indicators which related to their objectives and targets were important. Moreover, the help the regimes afforded their signatory actors in acquiring the preventative sustainability information they needed to manage effectively was essential. Furthermore, the assistance UNEP and WA SIG provide to enable IDCP and CPS actors to identify and track key indicators of sustainability performance and other data necessary to achieve their objectives was decisive.

#### **UNEP's IDCP and WA SIG's CPS internal sustainability action**

Both the IDCP and CPS were committed to achieving effective policy objectives and targets as part of their internal sustainability facilitation interests. The facilitation objectives of UNEP's IDCP and WA SIG's CPS sustainability interests generally aimed at initiating or carrying on effective sustainability communication. The facilitation targets of the regimes by and large sought to produce the greatest possible extent of effectiveness in the instigation or continuance of sustainability communication whenever and wherever possible.

#### *Experience sharing and multi-stakeholder partnership strategy*

UNEP and WA SIG made sure that IDCP and CPS actors identify and track key indicators of sustainability performance and other data necessary to achieve their objectives. For example, UNEP assisted signatory actors in acquiring the preventative sustainability information they needed to manage effectively, and helped signatory actors establish specific preventative sustainability performance indicators which related to their objectives and targets. In its efforts to address

sustainable development effectively, UNEP underscored the necessity of delineating and elucidating Sustainable Consumption with regard to developing and developed countries (Nyati, K. P., 2001: 9; UNEP, 2001s: 71, 2001t: 72, 2001u: 71), and to initiate a drive to better appreciate what pushes consumption. In addition, UNEP had control processes in place to regularly evaluate IDCP actors' conformity with relevant legal and other sustainability compliance. For example, one of UNEP's major foci was the arena-wide Cleaner Production consolidation in terms of awareness-raising and capacity-building (Aloisi de Larderel, J., 2001: 5; Ntagazwa, A. D., 2002: 4) and the expansion of the scope of Cleaner Production to deal with the rebound effects of unsustainable consumption by encouraging a life cycle economy that integrates Cleaner Production (Töpfer, K., 2001: 3; UNEP, 2001k: 6-7). The regime pursued the incorporation of the life-cycle expanded definition of Cleaner Production in Sustainable Consumption thinking (Maltby, L., 2002: 10; UNEP, 2002k: 38, 2002t: 11). UNEP drove the development of a common Sustainable Consumption and Production language (Baas, L., 1998: 28-29; UNEP, 2002g: 8).

WA SIG helped to develop a professional exchange of ideas with and among CPS actors through site visits, seminars, and workshops concentrating on Cleaner Production. The regime's efforts were directed at developing CPS actors' awareness of opportunities for sustainability practices. These included the Cleaner Production topic of waste management by the implementation of efficient waste acceptance and separation techniques (WASIG, 2000a: 2). Moreover, WA SIG assisted signatory actors in acquiring the preventative sustainability data they require to manage effectively.

*Dialogue with interested parties and multi-stakeholder partnership strategy*

UNEP and WA SIG ensured that IDCP and CPS actors' preventative sustainability performance was frequently monitored. For example, UNEP helped signatory actors establish specific preventative sustainability performance indicators which related to their objectives and targets. The regime tried to ensure the co-ordinated preparation of clear Cleaner Production goals and approaches, for instance, in the fulfilment of the possibilities offered by the mutually reinforcing ISO 14001 and the Cleaner Production approach (UNEP, 1998j: 21-23, 2001f: 24), or in following through a systematic implementation and monitoring approach to the development of regional Cleaner Production projects (UNEP, 1998c: 17, 1998o: 10, 1998p: 10, 1998q: 10-11, 1998r: 10, 1998s: 11, 1998t: 10).

In a similar vein, WA SIG undertook the development of a Western Australian Cleaner Production Statement (WACPS) to advance commitment from different stakeholders for the promotion and facilitation of Cleaner Production and Eco-Efficiency. The regime characterised Cleaner Production as an operational approach that reduces impacts, costs, risks and liabilities by avoiding the generation of waste and emissions (WASIG, 2005). Eco-Efficiency was delineated by WA SIG as a management approach that creates more value with less impact by delinking goods and services from the use of nature (WASIG, 2005). WA SIG's government signatories adopted and promoted Cleaner Production principles as the preferred approach for developing and implementing policies and plans. Manufacturer, service, and educational institution signatories assessed the Cleaner Production approach and had expertise to apply it into their own operations. Consumers were supported in demanding products and services that are provided by enterprises that practice Cleaner Production.

*Education and training and multi-stakeholder partnership strategy*

UNEP and WA SIG pursued the diffusion of Cleaner Production principles and practices. The regimes engaged in a wide variety of actor- or sector-specific research projects involving the development and dissemination of applicable sustainability information. For example, UNEP emphasized the amalgamation of Cleaner Production and technology innovation (Dae-Jung, K., 1998: 3; Fussler, C., 2002: 78-81; Geiser, K., 2002: 75-78; Jaworski, J. F. & Minns, D. E., 2001: 60-63; Mansfield III, W. H., 1998: 42-43; UNEP, 1998b: 17-18, 1998l: 14-15, 1998w: 5, 2001r: 14-18, 2002w: 18), which included the detection and support of biotechnology applications for Cleaner Production (UNEP, 2001e: 12-14), and the identification, collection, and dissemination by UNEP of pertinent information. Similarly, WA SIG undertook a Cleaner Production postgraduate programme, but also training programmes in Cleaner Production (WASIG, 2000b: 3).

**UNEP's IDCP and WA SIG's CPS external sustainability action**

Both the IDCP and CPS were committed to attaining effective policy objectives and targets as part of their external sustainability facilitation interests. The facilitation objectives of the IDCP and CPS sustainability interests generally aimed at initiating or carrying on effective sustainability communication. The facilitation targets of the regime by and large aimed at creating the greatest possible level of effectiveness in the instigation or continuation of sustainability communication.

*Experience sharing and multi-stakeholder partnership strategy*

UNEP helped develop a professional exchange of ideas with external stakeholders through policy dialogue focusing on Cleaner Production. The regime's efforts aimed at promoting and developing its International Declaration of Cleaner Production (UNEP, 1998h: 26-27). It utilised existent information collection and dissemination tools (UNEP, 1998f: 20, 1998g: 18). The regime also deemed it critical to specify the more substantive content that Cleaner Production could give to the concept of continual improvement and the more strategic overall direction it could provide an environmental management system with (UNEP, 1998a: 18-19, 2002n: 21; Yamada, Y. & Parasnis, M., 2002: 55-60). Similarly, WA SIG's efforts zoomed in on promoting and developing its Western Australian Cleaner Production Statement. Potential signatories were made aware that WA SIG advocates creating more value with less impact (WASIG, 2005).

*Dialogue with interested parties and multi-stakeholder partnership strategy*

UNEP sought to gather and consolidate existing experiences on alternative development models and to make them accessible for further reproduction, and to reinforce private sector engagement in multi-stakeholder efforts of promoting Sustainable Consumption and Production at different levels (Van Berkel, R., 2001: 28-32). Furthermore, UNEP assisted signatory actors in acquiring the preventative sustainability data they require to manage effectively. For instance, the regime endorsed simple language communication on Sustainable Consumption, drawing attention to the plus points associated with changed consumption patterns, in terms of furthering comfort and the environment (Evans, W. & Stevenson, R., 2001: 46-47; UNEP, 2001g: 14-15). In particular, UNEP looked at establishing ways of helping stakeholders to engage youth in



Sustainable Consumption and Production in a modern fashion (UNEP, 2001: 26-28).

Similarly, WA SIG looked into funding programmes for Sustainable Development (WASIG, 2000a: 6-7, 2003: 6). For example, WA SIG established contact with the Australian Greenhouse Office (Greenhouse gas emissions cutting, Alternative Fuels Conversion Programme, Cities for Climate Protection, Greenhouse Gas Abatement Programme, and Renewable Energy), the Natural Heritage Trust (Biodiversity Conservation, Sustainable Use of Natural Resources, and Community Building and Institutional Change), AusIndustry (Business Innovation, Venture Capital, Small Business, General Industry, and Industry Specific), and the Sustainable Energy Development Office (Renewable Energy and energy efficiency projects in WA, Energy Smart Business on the Photovoltaic Rebate Programme, Renewable Remote Power Generation Programme, and Solar Water Heating Subsidy).

In addition, WA SIG helped signatory actors establish specific preventative sustainability performance indicators which related to their objectives and targets. For instance, the regime developed a number of Cleaner Production case studies for WA businesses with support from Environment Australia and the Alternative Energy Development Board. WA SIG also worked in partnership with fourteen sponsoring participants (WASIG, 2001: 3) on sustainable resource processing to identify the dimension of the sustainability challenge for the resource sector and to establish research priorities in the areas of resource stewardship, eco-efficient production, secondary resource processing and breakthrough technologies, and regional synergies.

*Education and training and multi-stakeholder partnership strategy*

UNEP drove the espousal of policies and initiatives at all levels to give access to water for all, and the acknowledgment of the importance of efficient water management, the development of new water infrastructure, and demand side management (Brown, L., 2004: 8-11; Tortajada, C., 2004: 11-14; UNEP, 2004d: 14-15). The regime emphasised the importance of launching public-private partnerships as a major element in water sector development initiatives, and applying instruments, such as revenue generation, costs management, and future revenue-based financing, to gather finance for the development of the required infrastructure. Likewise, UNEP backed programmes for better demand side management and fewer distribution losses, through improved pricing, metering and fee collection systems, and supported developing countries' capabilities for the development and implementation of integrated water resource management programmes. Similarly, WA SIG advanced the diffusion of Cleaner Production principles and practices (WASIG, 2003: 7).

**5.1.2 Policy Measurement and Patterns of Regime Learning**

The sustainability facilitation activities of UNEP's IDCP and WA SIG's CPS exhibit a performance pattern. This pattern is common to all three of the regimes' facilitation interests. Differences among the individual regime's internal or external sustainability policies explain the degrees of regime performance of activity interests.

**UNEP's IDCP and WA SIG's CPS internal and external sustainability action**

UNEP and WA SIG measured their internal and external sustainability performance on an on-going basis. The regimes had a system in place for measuring actual performance against (future) IDCP or (future) CPS actors' sustainability objectives and targets in the areas of management systems and operational processes. This included evaluation of compliance with relevant sustainability legislation and regulations. The results were analysed by UNEP and WA SIG and used to determine areas of success and identify activities requiring corrective action and improvement. UNEP and WA SIG had appropriate processes in place to ensure the reliability of data, such as sampling. The regimes' identification of appropriate sustainability performance indicators for IDCP and CPS actors was an on-going process. The indicators were objective, verifiable, and reproducible, and they were relevant to IDCP and CPS actors' activities, consistent with their sustainability policy, practical, cost-effective, and technologically feasible. UNEP and WA SIG ensured the documentation of the findings, conclusions, and recommendations reached as a result of measuring, monitoring, audits and other reviews of IDCP and CPS actors' sustainability management, as well as the identification of the necessary corrective and actions.

UNEP and WA SIG also ensured that corrective actions were implemented and that there was a systematic follow-up to ensure their effectiveness. Records of the on-going operation of IDCP and CPS actors' sustainability performance were kept, covering legislative and regulatory requirements, permits, sustainability interests and their associated implications, sustainability training activity, inspection, calibration and maintenance activity, monitoring data, details of non-conformance and follow-up action, product identification, supplier and contractor information, and sustainability audits and management reviews. Essential to the successful implementation of the internal and external

sustainability policy was a good sustainability information management, which, in UNEP's and WA SIG's case, included means of identification, collection, indexing, filing, storage, maintenance, retrieval, retention, and disposition of pertinent sustainability documentation and records. Furthermore, UNEP and WA SIG carried out appraisals of IDCP and CPS actors' sustainability performance. The frequency of the regimes' appraisals was guided by the nature of the IDCP or CPS actor's policy in terms of its sustainability interests and potential implications.

### **5.1.3 Policy Measurement and Regime Learning Performance**

In both their internal and external sustainability facilitation policy, UNEP's IDCP and WA SIG's CPS both engaged in a thorough and continual execution of effective actions to realise sustainability partnerships in the regimes' main facilitation interests.

#### **UNEP's IDCP and WA SIG's CPS internal and external sustainability action**

UNEP and WA SIG measured their internal and external sustainability performance continuously. The policy measurements initiated in relation to sustainability facilitation hazards were made by combinations of scientific experts, corporate actors, and politicians. However, it was scientific experts, who are often also professionals in the field under consideration that dominated the successive parts of policy measurement (that is, initiation, terms of reference, conduct of analysis, and dissemination). The targets of the policy measurement were the IDCP and CPS signatories, which include governments, businesses, facilitating organisations, and the general public at the national or international level. What is more, there was reflection on the roles actually played by various

stakeholders in the preventative sustainability facilitation hazard management process. The policy measurements were attempted at all levels and with no restrictions in scope (that is, in relation to goals, mechanisms, and instruments). Furthermore, the measurements spanned all policy management actions, were deliberate, and had practical impacts (for instance, the adoption of new procedures or programmes). Perceptions or assumptions underlying the sustainability facilitation hazard management debate were affected by the policy measurement. UNEP and WA SIG acted decisively in these key activities of sustainability facilitation management and ensured that IDCP and CPS actors were performing in accordance with the stated sustainability policy.

## **5.2 Regime Resilience and Issue-Actor Direction**

As with the regimes' effectiveness in policy measurement issue-actor direction, the data demonstrate that the frequency of appraisive issue-actor configurations in multi-stakeholder co-operation is also a factor upholding the regimes' resilience in policy review issue-actor direction. Collective decisions and behaviour in later periods of the regime history are constrained to the extent that actors are furnished with means of continuous improvement in sustainability performance which they can make use of. A consideration and exploration from a dynamic perspective of the regimes' application of three multi-stakeholder facilitation strategies for the development of sustainability partnerships in preventative technology transfer is revealing. The facilitation strategies employed by the regimes in the development of sustainability facilitation issues can be classified in terms of the regimes' intra-institutional as well as inter-institutional preventative technology transfer through internal consultation, external consultation, and education and training.

Analysis of UNEP's IDCP and WA SIG's CPS action on policy review with regard to multi-stakeholder partnership strategies reveals the evolution of efforts by the regimes to document actual changes in critical areas. The two issues of internal and external sustainability facilitation were examined with regard to the three facilitation strategies of preventative technology transfer through internal consultation, external consultation, and education and training. Specific example areas of the regimes' sustainability facilitation performance have been reflected on before proceeding to ponder the regimes' general performance patterns and consider improvements over time in the regimes' facilitation performance. The focus is on the evaluation of key aspects in the management of preventative sustainability facilitation. These include aspects of the environment affected by sustainability facilitation hazards, human responses to these hazards, and results, such as changes in public opinion or in consumption patterns, of management approaches and specific implementation measures. For example, the IDCP and CPS made provisions for monitoring the activities relevant to preventative sustainability facilitation hazards. In addition, changes in the stakeholder system were monitored, with the regimes' monitoring also covering the stakeholder responses to preventative sustainability facilitation hazards.

### **5.2.1 Policy Review and Regime Action**

The focus of this comparative section is on UNEP's IDCP and WA SIG's CPS sustainability facilitation action on policy review. It will determine key aspects in the management of preventative sustainability facilitation relevant to the regimes attempts to ensure that IDCP and CPS actors periodically reviewed their preventative sustainability policy. The regimes' encouragement of signatory actors to involve the appropriate staff in the review of their preventative sustainability policy and the follow-up, for example, was important. Similarly,

UNEP and WA SIG support of IDCP and CPS actors in taking into account in their preventative sustainability policy review the views of interested parties was significant. Furthermore, the regimes' process to identify IDCP or CPS actors' corrective and preventive action and improvement was crucial.

### **UNEP's IDCP and WA SIG's CPS internal sustainability action**

Both regimes were committed to achieving effective policy objectives and targets as part of their internal sustainability facilitation interests. The facilitation objectives of UNEP's IDCP and WA SIG's CPS sustainability interests generally aimed at commencing or carrying on effective sustainability communication. The facilitation targets of the regimes by and large sought to generate the greatest possible measure of effectiveness in the commencement or continuance of sustainability communication.

#### *Experience sharing and multi-stakeholder partnership strategy*

UNEP and WA SIG made sure that IDCP and CPS actors periodically reviewed their preventative sustainability policy and, in the process, encouraged signatory actors to involve the appropriate employees in the review of their preventative sustainability policy and the follow-up. For example, UNEP had a continuous process in place to identify IDCP actors' corrective and preventive action and improvement and verified that project-related corrective and preventive actions and improvements by IDCP actors were effective and timely. In its efforts to address sustainable development effectively, UNEP turned to consumption and demand side issues (UNEP, 2002a: 24-25, 2002b: 13-16, 2002g: 8, 2002p: 6). In terms of demand side matters, the regime called for a change of focus from processes to products and services (Allenby, B. R., 2001: 9), whilst remaining

attentive to the social and ethical dimensions (Geiser, K., 2001: 33-36; Mebratu, D., 2002: 60-63), as well as the more technical ones. As to supply side matters, UNEP focused on the backing of Sustainable Consumption patterns (Barbut, M., 2004: 4; Green, R., 2002: 33-36; Jae-Wook, C., 1998: 4; Jiménez, A. C., 2004: 3; Kuzvart, M., 2001: 4; Paredes, V. E., 2002: 36-38; Ruffing, K. J., 1998: 12-15; Töpfer, K., 1998: 3-4, 2001: 3, 2002: 3, 2004: 3; UNEP, 1998l: 5, 2004c: 5, 2004i: 7-8), stressing the need for key elements of a consumption programme to include local relevance, local solutions, and cultural diversity (UNEP, 2001q: 37-40). Furthermore, the regime emphasised the importance of developing a network of interested parties on Sustainable Consumption (Lines, M., 2001: 68-70) and the collation of case studies connected with consumption (Adriaensens, B., 2002: 88-91). UNEP also accentuated the need for a small group of experts to study and evaluate emerging trends and produce a vision for the future of Sustainable Consumption and Production to culminate in an action plan.

Moreover, UNEP supported IDCP actors in taking into account in their preventative sustainability policy review the views of interested parties. For example, UNEP focused the expansion of the traditional Cleaner Production spotlight on processes at the plant level (Masaki, K., 1998: 40-41; UNEP, 1998e: 13-14). UNEP sought to identify and share initiatives by bringing into play partnerships, case studies, the recognition of champions, and the use of existing initiatives (Sy-Palanca, I., 2002: 10; UNEP, 2002f: 12), to assist large companies in their efforts to integrate technology sharing with small and medium-sized enterprises as part of their CSR initiative and standard in their business manuals (Kanniah, R., 2002: 41-44; UNEP, 1998v: 16-17; von Geibler, J. & Kuhndt, M., 2002: 63-67).



Similarly, WA SIG's efforts aimed at developing CPS actors' awareness of opportunities for sustainability practices. WA SIG also had a process to identify CPS actors' corrective and preventive action and improvement and verified that corrective and preventive actions and improvements by CPS actors were effective and timely. In addition, the regime supported CPS actors in taking into account in their preventative sustainability policy review the views of interested parties. This covered a great variety of Cleaner Production topics, such as waste reduction (WASIG, 2000a: 3, 8), or materials recovery to reduce waste to landfill (WASIG, 2003: 4). Another Cleaner Production focus of attention was energy efficiency and waste minimisation in waste water treatment (WASIG, 2001: 2), the reduction of heat losses (WASIG, 2001: 2), heat recovery (WASIG, 2001: 2), the introduction of reusable parts (WASIG, 2001: 2), and improvements on lighting fundamentals (WASIG, 2001: 2). A further Cleaner Production focus was cost efficiency (WASIG, 2001: 3). Also a Cleaner Production theme was the use of sustainability performance indicators as a management tool to monitor and reduce the use of electricity, gas, water, effluent, and dry waste (WASIG, 2002: 3).

*Dialogue with interested parties and multi-stakeholder partnership strategy*

UNEP considered the role of regional 'roundtables' (UNEP, 2001: 26-28) in co-ordinating the many Cleaner Production projects developing world-wide (UNEP, 2001b: 51-53). UNEP aimed at the co-ordination of the US and Canadian Pollution Prevention Roundtable, Cleaner Production Roundtable of the Americas, the Cleaner Production Regional Consultative Group for Africa, the Asia-Pacific Cleaner Production Roundtable, and the European Roundtable and the Regional Environmental Centre and their integration into a structured programme, as well as the incorporation as a central element of a 'roundtable of roundtables' meeting into UNEP's Cleaner Production review seminar. Similarly,

WA SIG's efforts aimed at engaging current and future stakeholders to work towards the realisation of the objectives and outcomes of the Statement and continue promoting the Statement, with WA SIG providing assistance to the various stakeholders in implementing Cleaner Production actions. This included assisting with the development and implementation of Cleaner Production Action Plans that focused in particular on awareness and promotion, and allowing current organisations to continue as a signatory after their first two year period. More importantly, the regime also permitted the removal of signatories for non-conformance and the introduction of a new category of 'Associates' to provide recognition of individual and small businesses contributing to the Statement (WASIG, 2002: 4).

In addition, signatory feedback was sought by WA SIG in a survey regarding the impact of the Statement and the potential improvements in its management and implementation (WASIG, 2004: 9). The survey content focused on Cleaner Production implementation in the signatory's own organisation, the fostering of implementation in other organisations, the influence on public policy, and the benefits to the signatory organisation. signatories' Cleaner Production action plans look at their organisation, commitment, plan, constituencies, objectives, activities, including constituency targeted, outcome indicators, planning, and, finally, the actor's way forward. The types of Cleaner Production activities signatories' Action Plans covered include actions in terms of implementation; awareness, promotion, and recognition; policy, advocacy, and regulation; education and training; and research and development. The survey response rate by signatory round was 83% for Round 1, 82% for Round 2, 91% for Round 3, 83% for Round 4, 77% for Round 5, and 100% for Round 6 (WASIG, 2004: 10). By signatory sector, the survey response rate was 78% for industry, 77% for industry associations, 75% for professional associations, 83% for community

groups, 93% for state governments, 93% for local governments, and 100% for tertiary education institutions (WASIG, 2004: 10). According to the survey findings, more than 85% of action plans included implementation and promotion, and less than 15% of action plans included education and R&D (WASIG, 2004: 5).

Furthermore, expressions of interest were regularly circulated to all stakeholders in WA SIG to invite nominations, and the regime frequently looked for industry sponsorship for major events and for general operations. In a survey, signatory participants from government, business, and facilitating organisations, such as consultancies, industry associations, and the community were given the opportunity to air their views on how WA SIG could better serve the interests and requirements of the group and how WA SIG could best support business and community work towards a clean and competitive WA (WASIG, 2003: 8). Respondents agreed in the majority that WA SIG could best be characterised as an advocacy group for business and sustainable development with the advocacy role needing to be determined. Respondents highly appreciated WA SIG's work, but emphasised that a clear direction on an appropriate organisational structure was to be achieved. They wished WA SIG to continue supporting signatory organisations and organising workshops, site visits, the WA Cleaner Production and Eco-Efficiency Roundtable, and signing ceremonies to the WA Cleaner Production Statement (WASIG, 2003: 8).

#### *Education and training and multi-stakeholder partnership strategy*

UNEP's main aim was developing awareness and willingness amongst local banking and community financing plans (UNEP, 2001a: 24-26), including seed funds, installation and growth capital, with the active participation of local

business people, and expanding the services of National Cleaner Production Centres to the supply of energy services and local financing support through the development of green funding schemes (UNEP, 2001i: 16-17). Furthermore, UNEP supported IDCP actors in taking into account in their preventative sustainability policy review the views of interested parties. For instance, UNEP addressed the question of developing a marketing approach for sustainable agriculture in order to educate consumers, engage producers, and generally improve the image of sustainable agricultural products (UNEP, 2004b: 20-24, 2004e: 24). Here, the regime sought to develop guidelines and case studies that showed how sustainable agriculture might be translated into realistic and practical on-the-ground action, and develop a business case demonstrating proven merits from sustainable agriculture through benchmarking of benefits, business-to-business benefits, and benefits to intermediaries.

Similarly, WA SIG assumed the diffusion of Cleaner Production principles and practices. The regime undertook a number of collaborative sustainability research projects. This included a project on the application of Cleaner Production principles and tools for eco-efficient coal processing and utilisation processes to enhance the environmental and economic efficiency of those processes, with WA SIG providing a Cleaner Production review, Cleaner Production baseline assessment and integration, consultation and planning activities (WASIG, 2003: 7).

### **UNEP's IDCP and WA SIG's CPS external sustainability action**

UNEP's IDCP and WA SIG's CPS were both committed to reaching effective policy objectives and targets as part of their external sustainability facilitation interests. The facilitation objectives of UNEP's IDCP and WA SIG's CPS

sustainability interests generally aimed at initiating or keeping effective sustainability communication. The facilitation targets of the regime on the whole focused on producing the greatest possible amount of effectiveness in the establishment or maintenance of sustainability communication.

*Experience sharing and multi-stakeholder partnership strategy*

UNEP supported IDCP actors in taking into account in their preventative sustainability policy review the views of interested parties. For instance, the regime pursued the continuation of its role as a global facilitator, coordinating with other sustainability initiatives (UNEP, 2002v: 19) as well as the initiation of regional electronic Cleaner Production networks around the globe (UNEP, 2001d: 21). One of UNEP's goals, for example, was the facilitation of inter-regional communication. This could be seen in the regime's efforts to integrate Cleaner Production into the development of Technical Committee 207 of the International Organization for Standardization in order to advance Cleaner Production through its inclusion as a recommended requirement of 'continual improvement'.

Similarly, WA SIG's efforts aimed at endorsing and developing its Western Australian Cleaner Production Statement. Awareness was raised about the point that Cleaner Production principles were the preferred approach for developing and implementing policies and plans. Furthermore, emphasis was placed on the endorsement of the Cleaner Production Statement and WA SIG Charter which stipulated the development of an Action Plan by signatories and allows WA SIG to develop case studies, have a periodic update of the Action Plan, report annually on the implementation of the Action Plan, and reaffirm commitments after two to a maximum of three years (WASIG, 2004: 3).

In addition, WA SIG emphasised its role in assisting signatories with the development and implementation of the Action Plan, compiling case studies, providing the framework for the annual report, and publicising the signatory for its support and actions. Here, the regime identified CPS actors' corrective and preventive action and improvement and verifies that corrective and preventive actions and improvements by WA SIG actors are effective and timely. In the light of this, the regime's signatory register by rounds showed a steady growth of WA SIG membership: in May 2001, there were 24 signatories; in November 2001, 47; in June 2002, 64; in November 2002, 73; in June 2003, 85; in November 2003, 86; and in July 2004, 89 signatories. Of the 105 actors that became signatory since May 2001, 89 are currently active signatories, and seven were removed for ongoing non-compliance, four after the first commitment period and five as a result of mergers (WASIG, 2004: 3).

*Dialogue with interested parties and multi-stakeholder partnership strategy*

UNEP mainstreamed Cleaner Production in environmental governance and national economic development policies and programmes (Kuzvart, M., 2001: 4; Lindqvist, T., 2001: 41-45; Riordan, J., 2002: 44-48; UNEP, 2002h: 12-13). The regime supported the implementation of alternative development models (Massey, M., 2004: 33-35; UNEP, 2004g: 29-33), specifically replicating community and local initiatives (UNEP, 2001j: 23). UNEP's intention here was to boost capacities for an integrated assessment of Sustainable Development, and to make use of mechanisms facilitating the integration of alternative development models in existing initiative frameworks. The regime also shored up progress in the application of Cleaner Production in sectors such as services and infrastructure through the use of complementary approaches, including energy efficiency, safer production (Zwetsloot, G. I. J. M. & Ashford, N. A., 2002: 84-86), and resource

protection (Aloisi de Lardere, J., 2001: 5; Evans, W. & Stevenson, R., 2001: 46-47; Lovins, A., 2001: 9). UNEP worked on broadening the base of Cleaner Production stakeholders to embrace consumer-related organisations, the media, and market players, such as wholesalers, retailers, and suppliers.

WA SIG established a connection with the World Business Council for Sustainable Development (WBCSD) which culminated in WA SIG becoming a regional partner of the WBCSD to establish communication links and contribute to WBCSD working groups and sector projects (WASIG, 2000a: 6). The regime also sought communication links with other regional Cleaner Production networks (WASIG, 2001: 4), focusing on policy integration (WASIG, 2001: 4), highlighting the importance of addressing sustainable production and consumption together. Moreover, in its efforts to support CPS actors in taking into account in their preventative sustainability policy review the views of interested parties, WA SIG sought to get connected with other Cleaner Production stakeholders in Australia at local, state, and national level. The regime considered Cleaner Production initiatives, such as initiatives undertaken in WA, and initiatives from the United Nations Environment Programme, Environment Australia, the Victorian Environmental Protection Agency, or the Queensland Environmental Protection Agency, in order to work out the best way for signatories to the WA Cleaner Production Statement to move 'from statement to action'. One such initiative was the Sustainability Roadmap of the Queensland Environmental Protection Agency (WASIG, 2002: 4), which endeavoured to assist industry's progress towards sustainability by benchmarking, audits, and developing plans, putting systems and technologies in place that will lead to improved economic performance, leveraging approaches, innovation, and marketing approaches, and assisting in positioning the business to respond to and set future market realities.

In addition, WA SIG explored Sustainability concepts as part of the WA State Government Waste 2020 Taskforce (WASIG, 2000a: 8), such as Extended Producer Responsibility, Cleaner Production, Green Purchasing, and Sustainable Production and Consumption to reduce the quantity of waste being created in WA through to 2020. The concept of Sustainability Covenants was examined (WASIG, 2003: 4) as well as opportunities for eco-industrial parks in WA (WASIG, 2002: 3) incorporating industrial ecology principles in identifying the best land use or recognising synergistic opportunities and cross-industry environmental monitoring.

*Education and training and multi-stakeholder partnership strategy*

One theme that was particularly important to UNEP is the improvement of Cleaner Production financing (Bakken, P., 2001: 54-55). In this connection, the regime sought to continue building capacity for the integration of preventative initiatives in accounting and due diligence practices among associated stakeholders, such as financial institutions, enterprises, business schools, and the media, and to support revolving funds, as well as to get governments to formulate rules and incentives to stimulate investment in Cleaner Production implementation (Abeysekera, N., 2002: 52-55; Bielski, T. & Springett, D., 1998: 37-39; Tu, R., 1998: 30-36; UNEP, 1998n: 22-23, 2002m: 25, 2002o: 81-84). UNEP also pushed the promotion of sustainable energy systems as an attractive solution for business development. Here, the regime aimed to strengthen energy business models for the integration of alternative energy resources into existing energy systems, and to expand education curricula on energy development and management, with a particular focus on business schools. Similarly, WA SIG disseminated Cleaner Production principles and practices. The regime provided a



training package specifically for businesses (WASIG, 2002: 6) emphasising that Cleaner Production makes good business sense and that it involves prevention practices and requires a systematic approach. These initiatives helped WA SIG to identify CPS actors' corrective and preventive action and improvement and verify that corrective and preventive actions and improvements by CPS actors were effective and timely.

### **5.2.2 Policy Review and Patterns of Regime Learning**

A performance pattern can be deduced from UNEP's IDCP and WA SIG's CPS sustainability facilitation activities. The three facilitation interests of the regimes have a common performance pattern. The nuances in UNEP's IDCP and WA SIG's CPS performance of activity interests can be explained through the context provided by the individual regime's internal or external sustainability policy.

#### **UNEP's IDCP and WA SIG's CPS internal and external sustainability action**

UNEP and WA SIG reviewed and continually improved their internal and external preventative sustainability management, with the objective of improving their overall preventative sustainability performance. The regimes, at regular intervals, conducted reviews of the IDCP or CPS actors' preventative sustainability performance to ensure the continuing suitability and effectiveness of their internal preventative sustainability policy. UNEP's and WA SIG's review was broad enough in scope to address the preventative sustainability dimensions of all activities, products, or services of IDCP or CPS actors. The regimes' review of signatory actors' performance included a review of preventative sustainability objectives, targets and performance, the findings of IDCP or CPS actor performance audits, an evaluation of their effectiveness, an evaluation of the

suitability of the IDCP or CPS actor's preventative sustainability policy and the need for changes in the light of changing legislation, changing expectations and requirements of interested parties, changes in the products, services or activities of the IDCP or CPS actor, advances in science and technology, lessons learned from sustainability incidents, market preferences, and reporting and communication.

UNEP and WA SIG also continually evaluated the preventative sustainability performance of (future) IDCP and (future) CPS actors against their preventative sustainability policies, objectives and targets for the purpose of identifying opportunities for improvement. The regimes' continual improvement process identified areas of opportunity for improvement of the internal sustainability policy which lead to improved preventative sustainability performance. These areas included determining the root cause or causes of non-conformances or deficiencies, developing and implementing (a) plan(s) of corrective and preventative action to address root cause(s), verifying the effectiveness of the corrective and preventative actions, documenting any changes in procedures resulting from process improvement, and making comparisons with objectives and targets.

### **5.2.3 Policy Review and Regime Learning Performance**

In both their internal and external sustainability facilitation policy, UNEP's IDCP and WA SIG's CPS both engaged in a thorough and continual execution of effective actions to realise sustainability partnerships in the regimes' main facilitation interests, namely sustainability communication through experience sharing, through dialogue with interested parties, and through education and training.

### **UNEP's IDCP and WA SIG's CPS internal and external sustainability action**

UNEP and WA SIG made satisfactory provisions for monitoring the human activities relevant to the internal and external sustainability facilitation interests, including the stakeholder responses to the sustainability facilitation hazards in question. The regimes reviewed and continually improved their sustainability management. This helped improve their overall sustainability performance. Both, UNEP and WA SIG applied a continual improvement process to their sustainability facilitation management in order to achieve overall improvement in IDCP or CPS actors' sustainability performance.

### **5.3 Dependence and Regime Facilitation Mode**

The regimes' facilitation of preventative technology transfer was influenced by the preferential behaviour pattern of dependence. UNEP's IDCP and WA SIG's CPS issue-actor direction was moulded by the average frequency of appraisive issue-actor configurations. In terms of regime effectiveness, the enhancing effect of the regimes' respective policy measurement issue-actor direction on the ability of stakeholders to co-operate in preventative technology transfer was aided by dependence. With regard to regime resilience, the constraining effect of the regimes' respective policy review issue-actor direction on collective decisions and behaviour in preventative technology transfer was supported by dependence. With appraisive issue-actor configurations featuring notably in regime communication, dependence shaped the stability of the prevention regimes' action-factor equilibrium, allowing it to be tilted slightly towards multi-lateralism in collective decision and action.

## 6 CONCLUSION

This International Relations (IR) thesis takes as a starting point the calls for sustainable development which have been repeated by state and non-state actors worldwide in the tone established by the 1992 United Nations Conference on Environment and Development (UNCED). This emphasised the importance of manufacturing to progress beyond Pollution Control towards preventative approaches that minimise waste energy and materials, such as Cleaner Production. The existence of environmental regimes aiming to facilitate preventative technology transfer suggests that these seemingly incessant calls cannot be taken as testimony of an international community's resolve to sweat out the widely agreed necessity for diminishing the environmental impact of the evolution of industrialisation and the related growth. However, the mere existence of such regimes does not say much about their significance, that is, the regimes' effectiveness in achieving issue-specific collective decisions and behaviour in multi-stakeholder co-operation as well as the regimes' resilience when doing so.

Investigating the relationship between sustainable development and preventative technology transfer as part of this comparative case study, it became evident that pollution prevention regimes can be significant in sustainable development. Both, UNEP's IDCP and WA SIG's CPS can be considered fine examples of how sustainable development can be facilitated through preventative technology transfer, and, in consequence, of how the environmental impact of the advance of industrialisation and the associated growth can be reduced. The overall constructive nature and course of the regimes' internal and external facilitation action demonstrate that sustainable development can be facilitated through practical encouragement strategies which unite multiple stakeholders in partnerships for the intent of preventative technology transfer. Based on the

project's results for the IDCP and CPS, it was determined that regime facilitation mode can equip stakeholders with additional wherewithal to cope with the intricacies of preventative technology transfer. An examination of regime facilitation in regime communication confirmed that specific matters nominally attended to by the IDCP and CPS were seen to in ways that comply with the conditions for regime significance, including regime effectiveness and regime resilience. Specifically, the conception that the action-factors of dominance, detachment, and dependence in regime facilitation mode may promote stakeholder co-operation that is advantageous to sustainable development was demonstrated. In addition, it was shown that the action-factor equilibrium in the facilitation mode can allow a regime to transform collective decisions and behaviour for enriched sustainable development upshots. In the following, the implications of the action-factor equilibrium in regime facilitation mode as a decisive factor in regime significance will be discussed.

## **6.1 Dominance and Regime Significance**

The heavy frequency of prescriptive issue-actor configurations in regime communication considerably sways the stability of the prevention regimes' action-factor equilibrium. UNEP's IDCP and WA SIG's CPS issue-actor compass and issue agenda are both shaped by the preferential behaviour pattern of dominance. In terms of regime effectiveness, the aptitude of stakeholders to co-operate is amplified to the extent that regime sustainability thinking and activity is delineated by the respective regime issue-actor compass. With regard to regime resilience, collective decisions and behaviour in later periods of the regime history are constricted to the point that the sustainability issues addressed by the prevention regimes wind up in the purview of the issue-actor compass demarcated

beforehand. Dominance in these areas of sustainability policy action implies that the regimes' sustainability facilitation at this 'trend-setting' juncture is governed by sustainability issues that are acted upon in particular ways. As a result, the IDCP and CPS multi-stakeholder partnerships exploit opportunities for sustainable development presented by Cleaner Production in terms of the sustainability ideas integrated in the regimes' issue-actor compass and issue agenda.

With dominance directing the regimes' issue-actor compass and issue agenda, the overall stability of the prevention regimes' action-factor equilibrium is leaning towards what is designated a *uni-lateral regime facilitation mode*. Here, regime values as to preventative technology transfer are mostly settled independently of stakeholders. This raises an important question related to the character and motivations of actors. What does dominance in these areas of policy action mean for absolute-gains or relative-gains orientated stakeholders? As summarized in the Literature Review section, such stakeholders are self-interested, goal-seeking actors whose behaviour can be accounted for in terms of the maximisation of individual utility. The question of regime facilitation with absolute-gains or relative-gains oriented stakeholders in a dominance-centred issue-actor compass and issue agenda seems to be a captivating one that may be worth exploring further.

## **6.2 Detachment and Regime Significance**

The stability of the prevention regimes' action-factor equilibrium is greatly affected by the intense frequency of designative issue-actor configurations in regime communication. UNEP's IDCP and WA SIG's CPS actor agenda, policy

definition issue-actor direction, and policy planning issue-actor direction are all moulded by the preferential behaviour pattern of detachment. In terms of regime effectiveness, the capacity of stakeholders to co-operate is fostered to the degree that the roles of actors in the initiatives are put in writing. With regard to regime resilience, collective decisions and behaviour in later periods of the regime history are restricted to the extent that actors operate within the frames assembled on their behalf. Detachment in these fields of sustainability policy action means that the regimes' sustainability facilitation is governed by sustainability issues that are handled as information to be contemplated for action. Consequently, the IDCP and CPS multi-stakeholder partnerships make the most of opportunities for sustainable development conveyed by Cleaner Production in terms of the sustainability initiatives construed in the regimes' actor agenda, policy definition issue-actor direction, and policy planning issue-actor direction which, in turn, are rooted in the ideas initially assimilated in the regimes' issue-actor compass and issue agenda.

The policy definition issue-actor direction in UNEP's and WA SIG's internal and external sustainability facilitation provided a general sense of direction, principles of action, and goals with regard to the level of sustainability responsibility and performance required of (potential) IDCP or CPS actors. UNEP and WA SIG used internationally recognised guiding principles to help IDCP or CPS actors identify the broad scope of their attentiveness to sustainability and give diverse IDCP or CPS actors a shared collection of values. Furthermore, the regimes ensured that the IDCP or CPS actors' top management assume responsibility for implementing the policy and participate in the formulation and modification of the sustainability policy. Innovations in the regimes' formulation of facilitation action derived from sustainability practitioners with a scientific background and elaborate knowledge of the policy issues at hand. These involved the fixing of

preventative sustainability facilitation policy goals, the devising of a set of policy management responses apt for realizing these goals, and the selection of methods, such as command and control, incentives, or persuasion, for putting into practice those institutional reactions. Thus, UNEP's IDCP and WA SIG's CPS sustainability facilitation goals as well as the associated facilitation objectives and targets had clear beneficial implications for sustainability. In terms of regime learning performance, the IDCP and CPS were very good at perceiving their internal and external sustainability facilitation action and affirming commitment to it. The regimes' interests were taken care of directly, and the preventative sustainability facilitation hazards made out in these interests were managed in a non-circuitous fashion.

The policy planning issue-actor direction in UNEP's and WA SIG's internal and external sustainability facilitation conveyed effective response options meant to convert the causes believed to be responsible for the sustainability facilitation hazard being considered. This comprised response options coping with the causes assumed to be the trigger of the sustainability facilitation hazard after they have occurred, as well as the response options considered practical for converting sustainability in ways that unswervingly counteract the effects of such causes. The regimes' selection of response options comprised a systematic examination of the feasibility, costs, and benefits of measures of a technological, organisational, or behavioural kind that might be commenced to help to productively take charge of a particular sustainability facilitation hazard being considered. UNEP's IDCP and WA SIG's CPS action on policy planning with regard to formulating multi-stakeholder partnership strategies thus revealed an evident understanding of the nature and size, causes, consequences, likelihood, and timing of signatory actors' activities, tackling the resulting (probable) impacts of the related preventative sustainability facilitation hazards. As to regime learning



performance, UNEP's IDCP and WA SIG's CPS were very good at planning their internal and external sustainability facilitation action. Making full use of relevant internal and external sources of information, the regimes lent signatory actors a hand in isolating sustainability objectives and targets that manifest the sustainability policy and the significant sustainability implications related to their activities, products, or services.

The overall stability of the prevention regimes' action-factor equilibrium is slanted more towards a *uni-lateral regime facilitation mode* given that detachment rules the regimes' actor agenda, policy definition issue-actor direction, and policy planning issue-actor direction. As in the case of the regimes' dominance-centred issue-actor compass and issue agenda, regime values as to preventative technology transfer here are chiefly elected autonomously from stakeholders. Bearing in mind the temperament and driving forces of actors, it might be enquired: What does detachment in these areas of policy action entail with reference to absolute-gains or relative-gains orientated stakeholders? As signified in the Literature Review section, the thinking of relative-gains oriented stakeholders in particular is guided by the belief that utility functions of actors are (at least) partially inter-dependent, such that the gains from mutual co-operation that an actor's partners accomplish may encumber drastically the utility of this actor and consequently his or her enthusiasm to co-operate in the first place. The subject of regime facilitation with absolute-gains or relative-gains oriented stakeholders in a detachment-centred actor agenda, policy definition issue-actor direction, and policy planning issue-actor direction seems to be a stimulating one worthy of further exploration.

### 6.3 Dependence and Regime Significance

The relatively moderate frequency of appraisive issue-actor configurations in regime communication has some bearing on the stability of the prevention regimes' action-factor equilibrium. The preferential behaviour pattern of dependence models both UNEP's IDCP and WA SIG's CPS policy measurement issue-actor direction and policy review issue-actor direction. In terms of regime effectiveness, the propensity of stakeholders to co-operate is augmented to the point that actors are presented with means of self-assessment in sustainability performance which they can avail themselves of. With regard to regime resilience, collective decisions and behaviour at ensuing stages of the regime history are impeded to the degree that actors are delivered techniques of continuous improvement in sustainability performance which they can bring into play. Dependence in these areas of sustainability policy action signifies that at this point particular sustainability issues are selected as the favoured choice. As a consequence, the IDCP and CPS multi-stakeholder partnerships make use of opportunities for sustainable development extended by Cleaner Production potentially with the aid of sustainability instruments obtainable as part of the regimes' policy measurement issue-actor direction and policy review issue-actor direction.

Policy measurement issue-actor direction in internal and external sustainability facilitation exhibited effectual reflection on UNEP's and WA SIG's performance of policy management over time, allowing for learning better evaluation skills and practices in the process. The regimes frequently monitored signatory actors' project-related preventative sustainability performance, contributing by identifying, establishing, and tracking specific key preventative sustainability performance indicators pertaining to their policy objectives and targets and

making available the data needed to perform their policy aims. The regimes made a supreme effort to reflect on and evaluate their own and other stakeholders' performance in being a factor in the management of sustainability facilitation hazards. The IDCP and CPS communication exhibited a high degree of constant feedback between observations, actions, and objectives as part of policy measurement and evaluation. The regimes continuously subjected their sustainability facilitation action to retrospective analysis, identifying assets and flaws of the running policy process and integrating the conclusions into the definition, planning, and implementation of response options dealing with sustainability facilitation hazards. Concerning regime learning performance, UNEP's IDCP and WA SIG's CPS were very good at measuring their internal and external sustainability facilitation action. Constantly benchmarking their own performance in dealing with sustainability facilitation hazards against that of other stakeholders, the regimes were capable of assisting signatory actors in initiating deliberate measurements vis-à-vis significant sustainability aspects of their processes, products, or services.

The policy review issue-actor direction in internal and external sustainability facilitation delivered effective response options UNEP and WA SIG, putting in place, and supporting, signatory actors in embracing monitoring systems that screen the roots and upshots of sustainability facilitation hazards, with innovations in monitoring coming from scientific experts who amass, average, and convey monitoring data. Whilst the level could not be corroborated at which IDCP and CPS actors had a process for the recognition of institutional corrective and preventive action substantiating that corrective and preventive actions by IDCP and WA SIG actors were effective and timely, the regimes made certain that signatory actors involved the appropriate management staff in the review of UNEP's IDCP and WA SIG's CPS preventative sustainability facilitation policies

and the follow-up, thus persuading IDCP and CPS actors also to take into consideration the opinions of interested parties. In terms of regime learning performance, UNEP's IDCP and WA SIG's CPS were good at reviewing their internal and external sustainability facilitation policies. Whilst the degree could not be elucidated to which the institutional review efforts of signatory actors' activities were conditional on regular internal monitoring, the regimes themselves continually detailed concrete changes in key sustainability areas.

The overall stability of the prevention regimes' action-factor equilibrium is counter-balanced somewhat with dependence governing the regimes' policy measurement issue-actor direction and policy review issue-actor direction. The equilibrium tilts away slightly from the *uni-lateral regime facilitation mode* towards what is termed a *multi-lateral regime facilitation mode*. Counter to the regimes' dominance-centred issue-actor compass and issue agenda as well as the detachment-centred actor agenda, policy definition issue-actor direction, and policy planning issue-actor direction, the regime values as to preventative technology transfer at this point are predominantly agreed upon by stakeholder negotiation. Adopting an angle focusing on the personality and drives of actors, one might probe into the following: What does dependence in these areas of policy action involve for absolute-gains or relative-gains orientated stakeholders? Specifically, can rational utility-maximisers assume the part of role-playing uncertainty-reducers when inter-subjectively shared knowledge is utilised in multi-stakeholder co-operation? As alluded to in the Literature Review section, actors can experience enduring uncertainties about their interests and how to realise them under the circumstances of complex interdependence and the increasingly technical quality of issues. The aspect of regime facilitation with absolute-gains or relative-gains oriented stakeholders in a dependence-centred policy measurement issue-actor direction and policy review issue-actor direction

may well warrant further enquiry, especially when contrasted with policy action of a dominance-centred and detachment-centred nature.

#### **6.4 Regime Facilitation Mode and Regime Significance**

This thesis took as a point of departure worldwide appeals to attend to climate change without impinging on economic growth as well as dealing with concerns of energy security. Symptomatic here are the persistent calls of state and non-state actors stressing the need for more international co-operation in realising global sustainable development through the greater use of environmentally sound technology. With the under-utilisation of cleaner technologies the main concern of the global community, this thesis focused on regimes that shared a multifaceted institutional make-up with multifarious stakeholders co-operating in preventative sustainable development. Noting that existent International Relations (IR) literature explained the significance of regime co-operation by reference to actor motivations, this thesis employed communication-theoretical analysis with a view to assessing the import of regime facilitation in multi-stakeholder co-operation. The idea was to explain how matters of preventative technology transfer nominally addressed by a regime are dealt with, and in the process, offer assumptions as to how international co-operation problems might be dealt with more effectively. By adding this extra dimension to the notion of regime significance, this thesis extended the traditional IR view that illuminates regime formation in terms of the actor impetus behind co-operation to a perspective that clarifies regime outcome in terms of the facilitation of co-operation and the role of communication therein. Such a perspective is practical in that it helps elucidate how the structures and processes of facilitation within which actors interact can affect their behaviours, and thereby, regime outcomes.

By combining a communication-theoretical approach with a new triple-phase research methodology in the project analysis, it is possible to clarify the boundaries of regime-based preventative technology transfer in sustainability facilitation. As expounded in this thesis, the perimeters of IDCP and CPS facilitation policy action include sensible Cleaner Production content and, for the most part, *uni-lateral delivery* of it. However, the regime boundaries can clearly be pushed by employing predominantly *multi-lateral delivery* in the utilisation of opportunities for sustainable development as advocated by Cleaner Production. As revealed in the comparative case studies, the sustainability issues to be attended to in the multi-stakeholder partnership initiatives are, to all intents and purposes, nominated by the regimes which facilitate them. As a result, identification of the issues will create a uni-lateral decision, with stakeholders being induced to contribute to partnerships which have a preset programme. This presents IDCP and CPS actors with a predicament, since joining in could imply agreeing to a programme they might not stand for, whereas declining to get involved might lead to the partnership being carried out not including them and their views not being taken into account.

Compared to one-way uni-lateralism, two-way multi-lateral facilitation policy action possesses a number of bonuses that improve the development of multi-stakeholder partnerships in preventative technology transfer. Stakeholders can be congregated to concur in a collective vision of how to press forward in Cleaner Production, before organising preliminary position documents to associate in consultations about how to perfect the vision. Procedural guidelines in sustainability facilitation can be opted for by stakeholders to support discourse and consensus-building in an ambience that promotes candour, genuineness, and balance. Creative stakeholder communication between ambiguous partners can be

cultivated by isolating disproportionate diffusions of resources to let bona fide partnerships materialise in Cleaner Production. Fundamental divergence between actors can be confronted with capacity-building formulae formulated in an inter-active approach to steer clear of multi-stakeholder partnerships that are deficient in poise. This assists stakeholders in elucidating the diverse depictions or interpretations they embrace, circumventing the inequitable, uni-lateral, and opaque recognition of issues in preventative technology transfer.

In terms of making the most of the opportunities for sustainable development proposed by Cleaner Production, the two-way multi-lateral facilitation of multi-stakeholder partnerships proffers actors the chance to *collaborate*, rather than (merely) to *co-ordinate*, in preventative technology transfer. Engaging stakeholders in every facet of facilitation policy action is fundamental to realising the optimum partnerships, dedication to prescience, integrity, and legitimacy. Multi-lateral delivery allows sustainability questions to be espoused and the aspirations of the partnerships to be informed and acquiesced in by all the stakeholders. Multi-lateralism is an occasion for actors to become acquainted with and attune themselves to others, and to acclimatize to joining forces and bring to fruition avant-garde, all-embracing remedies in sustainable development. Multi-lateral facilitation helps to institute a discourse environment where actors can inter-relate in such a manner that their divergences and convergences become discernible so that they can commence considering feasible progress scenarios. Stakeholders can particularise their specific ambitions and anticipations, as well as construct a collective Cleaner Production agenda that manages a commonly agreed conundrum in preventative technology transfer. In order to attain a constructive contribution to sustainable development, dispute resolution techniques can be employed to help surmount confrontational relationships. By comparison, it may seem as if one-way uni-lateralism was the more effective of

the two facilitation options, with collective decisions and behaviour, as observable in the comparative case study, basically determined by issue networks transmitting ideas through group communication channels to (potential) regime members for adoption. However, by including channels of inter-personal communication, two-way multi-lateral facilitation can assist multi-stakeholder partnerships, incorporating diverse knowledge and skills through opinion leadership so as to attain the critical mass necessary for sustainable success in preventative technology transfer.

In conclusion, this thesis applied a new inter-disciplinary approach to analyse two major preventative environmental regimes in terms of their sustainability facilitation interests of internal communication, external communication, and education and training for the period 1998-2004. The related regime facilitation policies and strategies were broken down into the smaller component parts of ideas, issues, and hazards in sustainability facilitation. The issues were examined in terms of issue-actor configurations which are models for the preferential behaviour of stakeholders. The configurations were employed to clarify the regime communication channels of issue-actor compass or the regime mindset and outlook, issue agenda or the issues recognised by the regimes, actor agenda or regime partnership initiatives, and issue-actor direction or regime issue development. Depending on the kind of configuration encountered in the regime communication channels, prescriptive, appraisive, and designative behaviour models were identified and related to the respective action factor of dominance, dependence, and detachment.

As a result of establishing the frequency of the various configurations in regime communication, the action factor equilibrium for the regime sustainability facilitation was ascertained. The evidence of action factor presence found in



regime communication demonstrates an association between regime facilitation mode and sustainable development outcomes. Providing stakeholders with an additional capacity to deal with the complexities of preventative technology transfer, the action factor equilibrium in the facilitation mode appears to be decisive in the significance of a regime. Indeed, the comparative case evidence suggests that regime facilitation mode trumps regime sphere and composition. In this thesis, it is argued that the equilibrium in the facilitation mode allows a regime to modify collective behaviour for improved sustainable development results. Whilst one-way uni-lateral facilitation encourages actor co-operation, two-way multi-lateral facilitation supports stakeholder collaboration, the latter having the potential for exploiting relatively more opportunities for sustainable development offered by Cleaner Production.

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