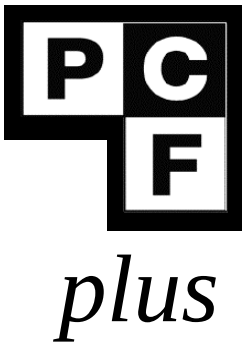

Carbon Market Intelligence Reports Executive Summary

Prepared for PCF*plus* Research by EcoSecurities Ltd.

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PCF*plus*

PCF*plus* is a research, training, and outreach program designed to complement the Prototype Carbon Fund (PCF). While an important goal of the PCF is to disseminate its experience, PCF objectives and resources restrict its research and outreach activities to those directly associated with project implementation. PCF*plus* is intended to assist PCF stakeholders (staff, participants and host countries), and the international community at large in understanding the complex issues related to the implementation of markets for project-based greenhouse gas emission reductions under the Clean Development Mechanism (CDM) and Joint Implementation (JI), with a view to reducing transaction costs and risks of doing business in the emerging GHG market.

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4 – Review and Analysis of the Emerging Greenhouse Gas Market
5 – Regulatory Drivers of the Carbon Market – Market Intelligence Issue #1
6 – Regulatory Drivers of the Carbon Market – Market Intelligence Issue #2
7 – Joint Implementation in the context of EU accession – the case of the Czech Republic
8 – Regulatory Drivers of the Carbon Market – Market Intelligence Issue #3

Market Intelligence Reports
Executive Summary

I. Introduction

The following pages summarize the key findings of the three Market Intelligence Reports prepared for the PCF*plus* Research Program by EcoSecurities. Report #1 was issued on June 2001, report #2 on October 2001 and Report III in March 2002. A general table of content is provided at the end of the present executive summary.

We structure our summary remarks around the following issues:

- GHG emissions profiles of Annex I states (until last reported levels) and indications on whether they are likely or not to meet their Kyoto targets;
- Key GHG policy directions across Annex I countries;
- Initiatives of private entities in carbon markets; and
- Key policy directions with regards to regulating development of the renewable energy markets; and resultant private initiatives in renewable energy markets.

For 2001, EcoSecurities notes much more activity in policy design than volume of private carbon market transactions, which underlines the yet embryonic state of carbon market development[1]. However, 2001 has been a *very dynamic* year in terms of carbon policy developments, on which we focus this Executive review.

[1] In our opinion, the withdrawal of the United States from the Kyoto regime has *substantially* slowed down the pace of evolution of the international carbon market.

II. Emissions profiles

Table 1. Last reported position and possible future position of selected Annex B country with regard to their Kyoto Target (MMtCO2e). Numbers in parenthesis refer to position of countries with regard to their EU "bubble" target (when applicable).

Country	In MI Report	Latest reported position		BAU Projections for 2010		Possible position in 2010
Australia	1	+ 31		+ 18		*Buyer*
Austria	2	+ 9	(+13)	+ 9	(+13)	*Buyer*
Belgium	2	+ 19	(+18)	+ 8	(+18)	*Buyer*
Bulgaria	3	- 45		- 10		*Seller*
Canada	1	+ 117		+ 103		*Buyer*
Czech Republic	3	- 38		- 27 to –53		*Seller*
Denmark	1	+ 6.5	(+15)	+ 12	(+21)	*Buyer*
Finland	2	+ 7	(+1)	+ 37	(+31)	*Buyer*
France	1	+49	(+5)	+ 70	(+26)	*Buyer*
II.1.1.1.1 Germany	1	- 95	(+60)	+ 66	(+222)	*Buyer*
Greece	3	+ 24	(-10)	+ 32 to +49	(-2.3)	*Buyer*
Hungary	3	- 8		- 10*		*Seller**
Italy	2	+ 63	(+55)	+ 103	(+96)	*Buyer*
Japan	1	+ 176		+ 319		*Buyer*
Netherlands	2	+ 34	(+30)	+ 53	(+49)	*Buyer*
New Zealand	2	+2		+ 15		*Buyer/ seller (?)*
Norway	1	+ 6.7		+ 16		*Buyer*
Poland	3	- 130		-3 to-85		*Seller*
Portugal	3	+ 16	(- 6)	+ 16	(-6.2)	*Buyer/ seller (?)*
Romania	3	- 80****		+41****		*Buyer/ seller (?)****
Russia	3	- 1073		- 89 to –122***		*Seller*
Slovak Republic	3	- 17		- 5.4 to -13		*Seller*
Spain	3	+ 82	(+14)	+ 84	(+15)	*Buyer*
Sweden	1	+ 6.4	(-1.9)	+ 9	(+1)	*Buyer/ seller (?)*
Switzerland	2	+4.3		+ 4.2		*Buyer/ seller (?)*
II.2 Ukraine	3	- 455		- 152 to –68		*Seller*
United Kingdom	1	- 11	(-25)	+ 5	(-11)	*Seller*
United States**	1	+ 1033		+ 2154		*Buyer*
TOTAL		**Annex B w/o US: - 1299** **EU total: + 168**		Annex B w/o US: +690 (averaged) EU total: + 473		

Source: Calculations by EcoSecurities based on emission levels and business as usual projections for 2010 included in latest National Communications to the UNFCCC available at date of completion of report.

Notes:

* *Hungary's national communication only projected CO_2 emissions, and not aggregate emissions. In addition, projections are provided for 2002, and not for 2008-2012.*

** *We report the US data for comparative purposes regardless of its withdrawal from the Protocol.*

**** EcoSecurities gives the most conservative estimate of Russia's potential supply of AAUs.*

***** As of Jan.2002, Romania's most recent National Communication was dated 1994. There is thus a very large uncertainty associated with these projections.*

The third column of Table 1 translates latest known emission levels at time of completion of the reports (usually 1998 or 1999). It demonstrates that Annex I is currently below its Kyoto target by about 1.3 billion tons of CO2e. However, most Annex II countries are above their target, while Transition economies are below. The EU, for example, is about 168 MtCO2e above target.

Projections summarized on column 4 must be taken with a lot of caution. They indeed reflect the business-as-usual scenarios proposed by parties in their latest National Communications at time of completion of the report. Most of these projections were completed around 1995-1997, and thus reflect information available and expectations at that time, and some wedge with latest available emissions is perceptible. It must also be noted that we have considered here "without policies" scenarios.

It is interesting to note, however, that Annex B without the US would is projected to experience a deficit of AAUs of the order of magnitude of 700 MtCO2e, two third of which coming from the European Union[2].

III. Policy Directions

III.1 Likelihood of Kyoto Ratification by 2003: Positions of Key Players

With respect to Kyoto ratification, EcoSecurities has observed three different types of reaction from members of the Umbrella Group and the EU:

European Union:

- We witnessed an aggressive move by several European states and the EU Commission to support the Kyoto agreement in the light of the American position. Namely, in late May 2001 Denmark has become the first EU state to make a formal commitment to ratify the Kyoto protocol, which was followed by the actual ratification of the Protocol by Portugal in the Fall 2001. Before COP-7 in Marrakech the EU reiterated its commitment to ratify the treaty as a group and mandated all West European states to do so by the *Rio +10* Conference in Johannesburg;[3]

[2] All conclusions related to the size of carbon credits market are rough approximations due to:
a) EcoSecurities did not consider carbon credits demand/supply from small economies – such as Latvia, Lithuania, Estonia and other East European/West European small states;
b) More importantly – we did not consider historical emissions or emissions projections for HFCs and CFs as such data were not included in the emissions projections published in National Communications, on which we based our decisions with respect to the credit *buyer*/*seller* position. Given a very high GWP ratio for some of these GHG and absence of the reliable data/projections on HFC and CF emissions, we cannot estimate the validity range for our conclusions.

[3] In addition, Sweden has ***twice*** increased its emissions reduction target by 2 per cent each time, committing to the four-percent GHG emissions reduction by the end of the first commitment period. Germany, meanwhile, has reaffirmed its 20+ per cent emissions reduction target regardless of the stringent opposition of a number of national business associations.

Former "Umbrella Group"

- In the former 'Umbrella group', New Zealand has also expressed its committed to ratify the Treaty by the Fall 2002, but this plan faces substantial opposition from various New Zealand business interests. There also remains a serious conflict over the ratification of Kyoto in Australia, which would inevitably influence New Zealand's stand on this issue.

  The official position of Japan, which remained a close ally of the US during Kyoto negotiations, is that the country will ratify the Kyoto Protocol by Rio+10; however, at the same time, Japan insists on bringing the United States back into the emissions trading regime and moves away from instituting mandatory emissions reduction targets for Japanese business while focusing on technological R&D and investigation of large-scale CDM projects in China and South-East Asia. Thus, the Japanese position is somewhere between the European Union and Australia, which remains worrisome for the prospect of Kyoto ratification.

Russia

- Russia has near absence of elementary institutions and regulatory mechanisms, which would permit this country to ratify the Protocol 2002 or 2003. Regardless of a kaleidoscope of national energy efficiency programs and pilot JI projects, Russia still has to create a legal foundation for meaningful participation in the Kyoto regime, not to mention the need to complete its national GHG inventory. Therefore, we do not foresee Russian participation in emissions trading under Kyoto Article 17 even if Russia ratifies the Treaty in late 2002 or early 2003. According to information obtained by EcoSecurities, Russia is not likely to ratify the Kyoto Protocol until the second part of 2003.

  The decision on ratification by the governments of Japan, Canada, Russia and Australia remains critical for Kyoto's coming into force. As we continue to receive conflicting signals from these jurisdictions, EcoSecurities estimates that by the end of 2002 the European Union is likely to become the only player *actually* ratifying the Treaty.

United States

- In our First and Second Reports (especially Report II, Section 3 and Appendix I) we dedicated a great deal of effort to scrutinizing the American position on the subject of it rejoining the emissions trading negotiations. Remaining in relative inaction with respect to climate change due to its internal security priorities until December 2001, the US has recently decided to offer its *alternative* to the Kyoto Treaty, which will be based on stabilizing GHG emissions by reducing carbon intensity of national economy by 18% by 2012, were the US will be measuring emissions reduction targets relative to the rate of economic growth. Such an approach will be contradictory to the spirit of Kyoto, which refers to *absolute and binding* emissions reduction terms. Therefore, the US is more and more likely to remain *outside* of the Kyoto regime – at least until the expiration of the Bush Administration term at the end of 2004 (technically, January 2005).[4]

[4] Our argument is supported by a parallel observation, which we included in our Reports #1 and #2: the current US Administration energy policy *heavily* emphasizes the expansion of North American carbon-intensive fuel production, making no reference to the greenhouse gas problem whatsoever. The on-going

Nevertheless, there is a great deal of climate change developments in the US -- especially at State level and within the US Senate. We illustrate most important ones below.

III.2 Internal Policy Trends in the United States

1) In the absence of federal commitment to GHG reduction, we observed a plethora of multi-tier State-based policy initiatives and legislative actions within the United States, such as: development of bottom-up GHG inventorying protocols (in a range of states), legislation of mandatory GHG emissions caps for state utilities (Massachusetts), development of CO_2 reduction measures for transportation (California), establishment of funds sponsoring carbon-offset projects (Oregon Climate Trust, Oregon and Seattle, Washington), discussion of forestry/agriculture carbon sequestration incentives (a number of states), development of CO_2 emissions trading regulations (New Jersey), and so on.

2) We also observed a noticeable difference between the activities of the US *Congress* (the legislative branch of the US government) and the US *President's Administration* (the executive branch). Namely, as of January 2002, the US House members and Senators have cumulatively proposed: 2 GHG emissions reduction and technology risk management regulations; 5 GHG reporting requirement acts; 13 budget adjustment and fiscal appropriation acts for supporting mitigation of national GHG emissions; 3 Kyoto support--foreign relations laws; 1 GHG utility emissions reduction acts (with 7 additional versions); 11 carbon sequestration laws and a great number of energy efficiency and renewable energy initiatives, all of which, in sum, have a potential to change the *internal/domestic* approach to GHG abatement within the United States. As a matter of fact, we continue to see the *largest* number of legislative initiatives coming from various congressional districts within the United States relative to any other nation in the world, all of which makes us optimistic about the US return in the emissions reduction "tracks" – albeit *outside* of the Kyoto mechanisms.

Meanwhile, the year 2001 demonstrated a dynamic growth of domestic emissions trading initiatives within the European Union, which expressed its hope to ratify Kyoto by June 14 2002.

III.3 Internal Policy Trends in the EU

1. In our Second Report (June 2001) we reviewed the design of first national cap-and-trade emissions trading systems in the UK and Denmark, which are now being supplemented by the EU-wide emissions trading scheme (still under discussion). National trading systems are also being developed in Norway (close to completion and functional in

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political stalemate around President Bush's national energy plan (especially after the collapse of *Enron*) reveals a great deal of political conflict surrounding prioritization of national energy policy. Still, the focus of major political debate does not indicate that the United States is likely to return to the wide-scale consideration of the national GHG reduction plan until we see a major political power shift in Washington.

2005), Netherlands,[5] and Germany. There are trading proposals on the table in France and Switzerland, with the latter semi-mirroring the British trading scheme.

In all emissions trading proposals we observe the tendency to cover all energy–intensive sectors, to exempt selected companies with disproportional short-term costs, allow for maximum regulatory flexibility and to encourage wide-scale participation of all sectors in the trading system. The UK emissions trading system, which has just registered 46 companies for the first trades (to commence on April 1, 2002), is expected to be partially replicated in all EU jurisdictions.

Again, we are awaiting with great interest the finalization of the German, Swiss and Norwegian national trading schemes. No indication of national emissions trading was received from East European states at any time of our research.

2. Within the European Union, *transportation* remains the most troublesome policy domain with respect to GHG emissions reduction. In January 2001 the EU Environmental Bureau confirmed that the EU efforts to reduce emissions in transportation have been weak or/and non-enforceable. In the spring/summer 2001 the EU began to aggressively promote biofuel/ethanol demand, mandating 5 percent of all car fuel to come from renewable sources by 2005. However, with the exception of this biofuel policy target, the EU transportation sector has yet to propose a coherent multifaceted approach to reducing the stubbornly climbing GHG emissions from mobile sources.[6]

IV. Private Entities and Carbon Market

IV.1 Voluntary Targets

With regards to the private sector initiatives, the major development observed by EcoSecurities in preparation of our reports is the launch of voluntary emissions reduction initiatives by a vast number of private entities, where the US companies *lead* this process. We conclude that:

- Voluntary GHG emissions reduction commitments are highly heterogeneous. Namely, cross-nationally, companies have adopted different kinds of targets, which depend on the nature and location of their business units, business models and specifics of production activities;

- *Most* companies choose to accept an 'in-kind' flexible emissions reduction target, such as: to increase the percent of renewable energy consumed (such as done by most of the companies in our report), or to increase fuel energy efficiency of their products (such as the targets set by Ford) and to set up a quantified energy efficiency targets;

[5] However, in January 2002 we reviewed a number of economic analysis, which indicated that the Dutch are considering an internal trading scheme economically disadvantageous (premature) until the launch of global trading. Therefore, the fate of the Dutch national trading is far from certain.

[6] Especially in the light of the February-2002 information that even German and British GHG emissions are again on the rise, partially due to transportation.

- Only large multinationals with potentially large-scale exposure to GHG risks and/or expected high return from early carbon reduction actions – such as Shell, BP, Dupont, Alcoa -- have committed to quantified and verifiable emissions reduction targets to reduce investment uncertainty and benefit from the aforementioned '*early actions*';

- In the majority of cases reviewed for our report, corporate voluntary emissions reduction schemes are negotiated with public regulatory agencies on a *sectoral* basis, which indicates that such voluntary actions constitute political compromises, where private actors hedge against carbon taxes or/and other inflexible regulatory emissions reduction requirements; and

- Although it is impossible to provide a complete overview of all private-sector emissions reduction initiatives due to high heterogeneity of the nature of such commitments and because of their dynamic state,[7] EcoSecurities estimates the current *private sector* global demand for carbon credits to be close to 187 MTCO2e for 2005[8] and over 200 MTCO2e by 2008 (beginning of the first Kyoto Commitment period).

In addition to accepting voluntary GHG emissions reduction targets, private entities may chose a variety of strategies to engage in carbon transactions on the credit 'buyer' side. Those may include: individual investments in carbon offset projects or/and investments through 'buyers clubs', such as the *Prototype Carbon Fund* or the Dutch *EruPT/Carbon Credits* programs; acquisition of equity positions in *less* carbon intensive enterprises and/or purchase of investment in renewable energy assets. We expect all of these tendencies to continue well into 2002 and beyond.

IV.2 Most Important Trends

Among other developments contributing to the formation of the international carbon market we noticed the following trends:

1) A group of additional *intermediate credit buyers* has emerged; such buyers facilitate selection of GHG reduction projects for carbon financing, pool resources of interested entities and partially oversee project implementation thus reducing the risks associated with carbon project financing.

   Among others, such intermediaries include the *International Utility Efficiency Partnership*, *Oregon Climate* and *Seattle City Light* initiative (which was announced in

[7] In reviewing voluntary corporate commitments, *EcoSecurities* ran into a serious problem with the corporate response rate. On average, across ten jurisdictions where we attempted to gather first-hand information, our response rate was abysmal 4 per cent. In the United States our response rate was close to 15-20 per cent, while in Australia – the jurisdiction of the highest return of our questionnaires – it approached 25%. EcoSecurities did not attempt corporate interviews in Spain, Greece, Portugal and Italy because we did not have any *a-priori* information about large-scale corporate commitments in those states (with the exception of several initiatives by the Italian Enel, which needed further research).

[8] These numbers represent extremely rough estimates since about 40% of the companies reported in our study chose not to disclose their quantified emissions reduction targets. We also emphasize that 187 MTCO2e demanded in the form of carbon credits by 2005 apply to the ***private sector voluntary commitments***; this number does ***not*** apply to the national commitments under Kyoto. We stress that such targets are *voluntary*, where demand can be met through CDM projects *outside* of Kyoto 'caps'. Thus, the effect of this quantity demanded on international carbon prices should not be overestimated.

conjuncture with the 2001 Oregon Climate Change Trust RFP). We expect further proliferation of such project financing schemes, *especially with respect to CDM projects*.

2) Where governments do not make clear-cut GHG reduction rules or negotiate sectoral emissions reduction targets, private entities choose to pool resources to launch pilot GHG trading programs, the largest of which is exemplified by the *Chicago Climate Exchange* (CCX), which unites close to 50 US, Canadian, Mexican and European companies and non-commercial entities willing to get on the 'learning curve' of international emissions trading. What began as a limited-scale pilot project uniting several US Midwestern business, has grown into a large-scale private-public initiative[9]: among the *largest* CCX participants one can find *Alliant Energy*, *BP* (British Petroleum), *Calpine*, *Cinergy*, the *City of Chicago* and *Mexico City*, *Ford Motor Company*, *Interface*, *NUON*, *OPG* (Ontario Power Generation), *TXU Energy Trading*, *Waste Management*, *Suncor Energy*, *PG&E National Energy Group* and *ST Microelectronics*.

3) The volume of private trades continues to be small relative to the expected size of the international carbon market by the beginning of the first Kyoto commitment period. In the months after the Marrakech agreement, EcoSecurities came across information about the 220,000 tCO2e transacted in various forms of private contracts between Shell-Canada, Air Liquide (Canada), Elsam (Denmark), E.ON (Germany) and Entergy (US).

4) A Substantial trend noticed throughout 2001is the growing investment in carbon offsetting technologies. [10] EcoSecurities can list literally dozens of such deals, all of which constitute risk-offsetting strategies on the part of carbon-intensive enterprises.

5) As of the beginning of 2002, EcoSecurities considers that, on the global scale, the supply of emissions reduction credits continues *by far* to exceed the demand. There is no objective way to assess the quality pool of projects, which continue to contribute to the exponentially growing supply, but the sheer *quantity* of GHG reduction projects for sale indicates very competitive international pricing.

V. Renewable Energy

V.1 General Trends: focus on the European Union

In our review of renewable energy private sector initiatives and detailed analyses of energy policies, we focused mostly on the European Union (Appendix IV to Report #3) and the United States (Report #1) being able to dedicate only partial attention to the booming renewables markets in Australia (Report #3), Canada and the lesser-developed marketplaces of Japan, New

9 On the initial stages of this pilot, CCX will be trading greenhouse gas (Carbon) credits within the Midwestern Region of the United States. In most cases, such credits will be originating/will be demanded from / by the Midwestern operations of companies involved. The regional coverage of this initiative is to be expanded at some future point.

10 To illustrate this point: in our First report we reviewed the transaction between the Australian Woodside Energy and American Ocean Power Technologies, where Woodside energy purchased a 5 per cent stake in the above ocean wave technology company. Woodside has also invested in Ceramic Power, a leading Australian fuel cell company. As another example, in the mid-2001 the Dutch NUON and BP-Amoco invested US$100M in the US Green Mountain Power; German utility MVV Energie AG acquired Energy Photovoltaics.

Zealand (Report #3) and Eastern Europe.[11] Therefore, the revision of renewable energy trends will accentuate West European and North American developments.

The most important observation is that across *all* types of renewable energy technologies investigated in our reports (especially Appendix IV to Report III) investments in "green energy" continued to boom across Europe and North America as 'green' fund managers discover the potential of renewable energy industries. Reports released in July 2001 estimate the year 2001 value the *global* energy technology market at US$7 billion and the figure is expected to increase over ten times to US$82 billion by 2010. According to the IEA (International Energy Agency), for the next decade renewable energies are projected to be the *fastest* growing energy sector of consumption across the world; hence, the interest from institutional investors.

In 2001, across *most* Annex I jurisdictions, *wind power* undoubtedly occupied the leading position in regards to the largest share of public regulations and private investments. Providing financing incentives to support wind power development remains on the agenda of all national policy-makers.

In European Union, in July 2001, the wind power sector welcomed a new EU renewable energy law. As a result of this legislation, the EU wind community anticipates a dramatic increase in the number of new countries using wind power. This law aims to *double* the share of renewable power in European Union's energy mix by 2010. [12]

The directive also requires all EU nations to speed up the process of approving new wind energy projects, which favors small and medium-sized companies. As a result of this directive the European Wind Energy Association expects wind turbines generating at least 60 gigawatts in Europe by 2010, compared to 12.8 gigawatts developed by 2000.

The directive formed the cornerstone of the EU's climate change policy: it is estimated that installment of 60 GW of wind power by 2010 would reduce carbon dioxide emissions by 3.2 percent (by 2008) compared to the 1990 emissions levels.

As mentioned above in the section addressing the need to reduce transportation–related GHG emissions, in Western Europe among all renewable policy aspects the second place on the policy agenda is occupied by the introduction of biofuel as a substitute for gasoline in mobile sources of emissions.[13]

Although solar power has not experienced such dynamic growth as wind on the European continent, in 2001 Italy, Switzerland, Greece and even Nordic states have been actively involved in the development of solar technologies and promotion of solar-based electricity supply. . In 2001 our analysis concluded that without substantial financial support, photovoltaic and thermal

[11] Due to sever space limitations, EcoSecurities was not able to summarize the East European renewable energy policies, which nevertheless warrant serious attention.

[12] The law provides substantial flexibility with regards to its implementation to individual jurisdictions: it was adopted without harmonization of the European wind support schemes: the only uniform action required from all member-states is to ensure grid access for renewable energy sources. The absence of greed access has delayed wind power projects in Spain and in certain areas of Germany.

[13] However, outside of biofuel production and infrastructure development, in European Union the potential for biofuel use remains largely underdeveloped (with the exception of Nordic States). The most dynamic and well-developed biomass markets were observed in Sweden, Finland and especially in Germany.

solar technology is not expected to be cost-effective until post-2010. The same argument applied to the wave-power and tidal power – at least *with regards to the European Union*.

In sum, North American and EU Annex I states have greatly benefited from the wide-scale introduction of wind energy – a tendency we expect to continue well into 2002 and beyond. The detailed revision of the fate of other renewable technologies remained outside of the scope of our Reports.

V.2 Emergence of the Renewable Energy Certificate Trading and its Relation to the Carbon Market: European Union, North America and Asian Annex I

The newest and most important renewable energy market trend observed by EcoSecurities in 2001 is the proliferation of *Renewable Portfolio Standards* (or Renewable Obligations), which are now present in close to 70 per cent of all Annex I states. At the beginning of 2001 European RECs program participants included Denmark, Greece, Italy, Netherlands, Norway and Sweden in the RECs trading pilot phase. By the end of 2001 only South and selected East European states did not have national Renewable Portfolio Standards.

From 2001 through 2010 the total size of green certificate trading in Western Europe is expected to reach 41 billion Euros. In the wake of this development even Poland has launched the national 'green electricity trading' scheme in the summer 2002. Similar renewable energy structures are considered in all East European states aspiring ascendance to the European Union.

Similar to the EU, Renewable Portfolio Standards are being considered and adopted in the United States on the sub-national (State) levels in the absence of an overarching federal legislation. In fact, the United States and Australia have become the leaders in green electricity trading.[14] In the US, Renewable Portfolio Standards are adopted/operational in Arizona, Connecticut. Massachusetts, Iowa, Maine, Minnesota, Nevada, New Jersey, Pennsylvania, New Mexico and Texas.

In Australia the Renewable Energy (Electricity) Bill of 2000 aims to reduce GHG emissions through increasing the share of Australian electricity generated by renewable means from 10.5 percent to 12.5 percent by 2010 relative to the base year of 2000. In addition, a set of supplementary Australian regulations encourages region-wide trading in green certificates (RECs).

In connection to the above, EcoSecurities came across a limited number of discussions about the '*substitutability*' of international carbon trading for green certificate trading (and vise versa), and/or the relationship between the two markets. Such discussion is critically important for both policy makers and private entities interested in emissions reduction credits because decisions de-linking or merging carbon and 'green certificate' markets will affect the quantity of carbon credits available for sale/purchase and, subsequently, the volume and price of carbon transactions. In the United States the initial tendency is to *de-link* the two emerging markets; we were not able to assess the European position on this matter.

[14] On February 7, 2002 the Dutch *World Wide Green* company launched the first *international* web-based 'portal', through which global consumers of energy can buy a 'green update' of their electricity use.

Market Intelligence Reports (2001-2002)
GENERAL TABLE OF CONTENTS

Report 1 (June 2001)

Report 2 (October 2001)

Report 3 (February 2002)