

2 climate change

International Context of Climate Change

In 2002, 56 countries (i.e. 25 from Annex I and 31 from Non-Annex I) have moved forward to handle climate change issues. Likely, 2003 or 2004 would be the year that the Kyoto Protocol enters into force (however, it is solely depending on Russia's decision for the ratification of the Kyoto Protocol under the circumstance that U.S.A will not join the Protocol).

Status of the Climate Change Convention and the Kyoto Protocol

	2002				Annex I	Non-Annex I
	Q1	Q2	Q3	Q4		
Ratification	2	14	11	6	Austria, Canada, Denmark, Estonia, Finland, Germany, Greece, Italy, Latvia, Lithuania, Luxembourg, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, United Kingdom	Brazil, Bulgaria, Chile, Costa Rica, Cuba, Indonesia, Malaysia, Mali, Papua New Guinea, Peru, South Korea, Seychelles, Thailand, Vietnam
Acceptance		1			Japan	
Accession	6	2	8	3	Hungary, Iceland, Netherlands	Benin, Butan, Cambodia, Cameroon, Djibouti, Dominican Republic, Grenada, India, Jordan, Lao, Liberia, Morocco, Solomon Islands, Sri Lanka, Uganda, Tanzania
Approval		2	1		European Community, France	China

* 2002_Q4 includes January and February of 2003

* Annex I countries have obligatory reduction targets under the Climate Change Convention and the Kyoto Protocol.

* An explanation of legal terms can be found on-line at:
<http://untreaty.un.org/English/guide.asp#glossary>.

* The rules for entry into force of the Kyoto Protocol require 55 Parties to the Climate Change Convention to ratify (or approve, accept or accede to) the Protocol, including Annex I Parties accounting for 55% of that group's carbon dioxide emissions in 1990.

Regional Context of Climate Change

In line with 2002 regulatory developments in European countries in which most of them have ratified the Kyoto Protocol in 2002 it is expected that there would be more active regulatory requirements such as emissions trading, CO2 tax/energy tax, climate change agreement, energy efficiency, etc.

As Canada has ratified the Kyoto Protocol in December 2002, it is estimated that there will be more regulatory approaches to climate change on the North American side. In U.S.A even though there might not be stringent requirements at the federal level on climate change, some of the states sets requirements on Greenhouse Gas emission reduction and reporting from industrial facilities and in the transportation sector.

Asia-Pacific and Latin American countries would not actively regulate industrial facilities with stringent requirements, as countries have no obligatory reduction targets under the Kyoto Protocol (except Japan). Many countries in the region (e.g. Brazil, Chile, Mexico, South Korea, Malaysia, Thailand, etc) respond to climate change issues with improving measures such as energy efficiency labeling, building standards, energy audits, energy efficiency standards, voluntary agreements, tax incentives, demand-side management in energy supply, fuel efficiency, etc.

Country-Specific and Industry-Specific Approach to Climate Change

Apart from the politics of climate change at the international level, regulatory developments on climate change at the national level have been and are being focused on energy use such as energy efficiency, building standards, renewable energy, and emission reporting.

1. Energy Efficiency

With respect to energy efficiency, national energy labels and minimum energy performance standards are common measures taken by countries. Targeted products are varied country by country. Refrigerators, freezers and air conditioners are commonly regulated. Electric products are fast becoming targeted products.

Labeling programs and minimum energy performance standards (MEPS)

	Program	C/E	M/V	Regulatory Information/Implementing Agency
Argentina	-	C	M	Resolution of May 1999 Household appliances labeling
Australia	Star Rating Scheme (Electric)	C	M	State and Territory Government, National Appliance and Equipment Energy Efficiency Committee and Standards Australia publish regulatory standards
	Galaxy Energy Award	E	V	Initially a Victorian Program, becoming national
	International Energy Star	E	V	US EPA and US DOE develop endorsement criteria
	Mandatory MEPS			Air conditioner, freezers, motors, refrigerators, water heaters
Brazil	Programa Brasileiro de Etiquetagem-PBE	C	V	Programa Nacional de Conservacao de Energia Eletrica and National Institute of Metrology
	Stamp Procel de Economia de Energia	E	M	Programa Nacional de Conservacao de Energia Eletrica
Canada	EnerGuide Program	C	M/V	Energy Efficiency Act
	Environmental Choice ^M Program/EcoLogo	E	V	Environment Canada
	Mandatory MEPS			Air conditioner, ballasts, boilers, freezers, lamps, refrigerators, etc

	Program	C/E	M/V	Regulatory Information/Implementing Agency
Chile	-	E	V	National Energy Commission is developing
	Mandatory MEPS			Motors and refrigerators
China	Galaxy Energy Award	E	V	The Law on Energy Conservation of China
	Mandatory MEPS			Air conditioners-room, ballasts, irons, refrigerators, rice cookers, TV, etc.
European Union	Energy Label	C	M	National bodies of EU member countries
	GEA Label	E	V	Group for Energy Efficient Appliances
	European Eco-label award scheme	E	V	European Union Econ Labeling Board
	Mandatory MEPS			Ballasts, Boilers, freezers, refrigerators, etc.
Hong Kong	Energy Label	C/E	V	Electrical and Mechanical Services Department
Japan	International Energy Star	E	V	-
	Energy Saving Labeling System	C	M	The Law on the Rational Use of Energy/Ministry of Economy, Trade and Industry
	Top Runner standards program			Air conditioner, computers, lamps, copiers, refrigerators, freezers, TV, etc.
Korea	Energy Efficiency Rating Labeling Program	C	M	The Act on the Rational Use of Energy/Korea Energy Management Corporation (KEMCO)
	Energy-saving office equipment & home electronics program	E	V	KEMCO
	Mandatory MEPS			Air conditioners-room, ballasts, boilers, computers, lamps, refrigerators, etc.
Mexico	Eficencia Energetica	C	M	National Energy Savings Commission
	Sello FIDE	E	V	FIDE Trust for saving Electrical Energy
	Mandatory MEPS			Air conditioners, boilers, lamps, motors, refrigerator, transformers, etc.
Philippines	Philippine Appliance Energy Standards and Labeling Program	C	M	Department of Energy, Bureau of Product Standards and Association of Home Appliance Manufacturers
	Mandatory MEPS			Air conditioners-room, fluorescent lamp ballast
Poland	Energy Label	C	M	The Energy Law of 1997
	Polish Efficient Lighting Program/Efficient Lighting Initiative	E	V	International Finance Corporation
	Mandatory MEPS			Clothes washers, refrigerators, space heaters
Russia	ENERGOCOMPASS	-	-	Center for Energy Efficiency
	Mandatory MEPS			Air conditioners, audio, computers, freezers, monitors, printers, TV, etc.

	Program	C/E	M/V	Regulatory Information/Implementing Agency
Singapore	Green Labeling Scheme	E	V	Ministry of Environment
	Mandatory MEPS			Air conditioners-room
Switzerland	Energy 2000	C	V	Swiss Federal Office of Energy
Taiwan	Greenmark	E	V	Environment and Development Foundation
	International Energy Star	E	V	-
	Mandatory MEPS			Air conditioners-room, ballasts, motors, refrigerators, rice cookers, etc.
Thailand	Energy Label	E	V	The Energy Conservation Promotion Act of 1992/ Electricity Generating Authority of Thailand
	Green Labeling Scheme	E	V	Thailand Environment Institute
USA	Energy Guide	C	M	The Energy Policy and Conservation Act of 1975, the National Energy Policy and Conservation Act of 1978, the Energy Policy Act/ US Federal Trade Commission
	Energy Star	E	V	The National Appliance Energy Conservation Act/Department of Energy (DOE), Environmental Protection Agency (EPA)
	International Energy Star	E	V	DOE, EPA/International Partner-Japan, Australia, New Zealand, Taiwan, EU, Canada
	Mandatory MEPS			Air conditioners, boilers, ballasts, freezer, motors, microwave, water heaters, clothes dryers/washers, dishwashers, furnace, etc.

*C: comparative label (mostly mandatory in OECD countries), E: endorsement label (mostly voluntary)

*M: mandatory, V: voluntary

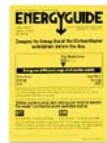
Even though labeling programs are national or regional wide they are not strictly restricted within the country or region. European Union label, for instance, has been adopted by other countries such as Bulgaria, Iceland, Poland, etc and US Energy Star program also has been adopted by other international partner countries.

Examples of Energy Labels

Swedish TCO



U.S.A Energy Guide



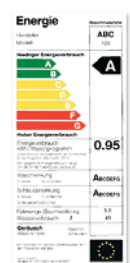
U.S Energy Star



Japan Energy Saving Label



EU Energy Label



Energy Rating



GEEA



Energy 2000



Energy Smart



2. Building Standards

It is true that buildings have a large proportion in energy consumption of a country. For instance, it is estimated that buildings consume around 40% of overall energy consumption in EU.

Energy efficiency standards for dwellings and service sector building have been set up in most of OECD countries including European countries, Australia, Canada, U.S.A, Japan, Korea, etc. Some other countries (e.g. Singapore, Philippines, etc) establish mandatory or voluntary standards for service buildings.

It is expected that integration of renewable and micro-power systems into the building codes would be increased with making small buildings subject to more complex performance-based building codes.

Energy Efficiency Standards for Buildings							
	Dwellings			Buildings			Monitoring
	Year	Status	Savings	Year	Status	Savings	
Austria	1991/98	M		1991/98	M		•
Belgium	2000	M		2000	M		•
Portugal	1988	M	25 %	1988	M	25 %	•
Germany	1995	M	30 %	1995	M	30 %	•
Ireland	1991/97	M	30 %	1991/97	M	30 %	
Italy	1994	M	10 %	1994	M	10 %	•
Netherlands	1995	M		1995	M		•
	2000	M	40 %	2000	M	40 %	•
Spain	1998	M		1998	M		
Sweden	1984	M		1984	M		
UK	1995		15 %		M		
Czech Rep.	1983	M		1983	M		
Hungary				1991	M	40 %	
Poland	1994	M	15-20 %	1994	M	15-20 %	
Australia	1997	M		1997	M		•
Canada	1982	V	20-50 %	1997	V		•
	1997	V					•
Japan	1999	M	18 %	1999	M	23 %	
Korea	1994	M		1994	M		
Mexico	2001	P,M		2001	P,M		

	Dwellings			Buildings			Monitoring
	Year	Status	Savings	Year	Status	Savings	
New Zealand	1999	M		1999	M		
USA	1998	V,M		1998	V		•
Chile				1999	M		
Hong Kong				1995	M		•
India				2001	P		
Indonesia				2000	V		
Philippines				1994	M		
Rusia	1990	M		1990	M		
Taiwan				1998	M	5-10 %	
			15 %		M		
Czech Rep.	1983	M		1983	M		
Hungary				1991	M	40 %	
Poland	1994	M	15-20 %	1994	M	15-20 %	
Australia	1997	M		1997	M		•
Canada	1982	V	20-50 %	1997	V		•
	1997	V					•
Japan	1999	M	18 %	1999	M	23 %	
Korea	1994	M		1994	M		
Mexico	2001	P,M		2001	P,M		

M = mandatory; P = planned; Pr = proposed

Savings: consumption reduction compared to dwellings/buildings built before the enforcement of the standards

3. Greenhouse Gas Emission Reporting

In order to take appropriate measures for Greenhouse Gas emission reduction with the ratification of the Kyoto Protocol (and potential entry into force of the Protocol) at the national level basically it would require to set up a national emission inventory followed by accurate and timely emission reporting from the facility level.

There are the following existing examples of mandatory greenhouse gas reporting programs in the European Union and Ontario and of voluntary programs in Quebec, Canada, California and Australia.

Examples of Emission Reporting

	Coverage of Facilities	Coverage of Gas	Competent Authorities	Legal Background
Ontario	Electrical generation, metal ore and non-metallic mineral mining, natural gas distribution, wood products, pulp and paper, petroleum refining, chemical manufacturing, iron and steel mills	CO ₂ , CH ₄ , N ₂ O, CFCs, HFCs, HCFCs, SF ₆	Ministry of the Environment and Energy (National Pollutant Release Inventory)	Ontario Regulation 127/01 (Airborne Contaminant Discharge-Monitoring and Reporting)
European Union	Member States (individual facilities involved in energy industry, production and processing of metals, mineral industry, chemical industry, waste management, pulp and paper, textile, etc)	CO ₂ , CH ₄ , N ₂ O, CFCs, HFCs, PFCs, SF ₆	European Commission (European Pollutant Emission Register)	European Commission Decision 2000/479/EC
Quebec	Voluntary participants	GHGs	EcoGESste Registry Office (Canada's Climate Change Voluntary Challenge and Registry Inc.)	Quebec's 1995 Climate Change Action Plan
Canada	Voluntary participants	GHGs	Canada's Climate Change Voluntary Challenge and Registry Inc.	-
California	Voluntary participants	CO ₂ , CH ₄ , N ₂ O, CFCs, HFCs, PFCs, SF ₆	California Energy Commission (California Climate Action Registry)	-
Australia	Voluntary participants	CO ₂ , CH ₄ , N ₂ O, CFCs, HFCs, PFCs, SF ₆	Australia Greenhouse Office	Greenhouse Challenge

From a practical point of view, the harmonization of Greenhouse Gas reporting practices is essential to measure and track progress on the reduction and fossil fuel usage at the corporate, national and international level. The Greenhouse Gas Protocol developed by the World Business Council on Sustainable Development and the World Resources Institute has been widely used, referred to by the following facilities and programs for Greenhouse Gas reporting:

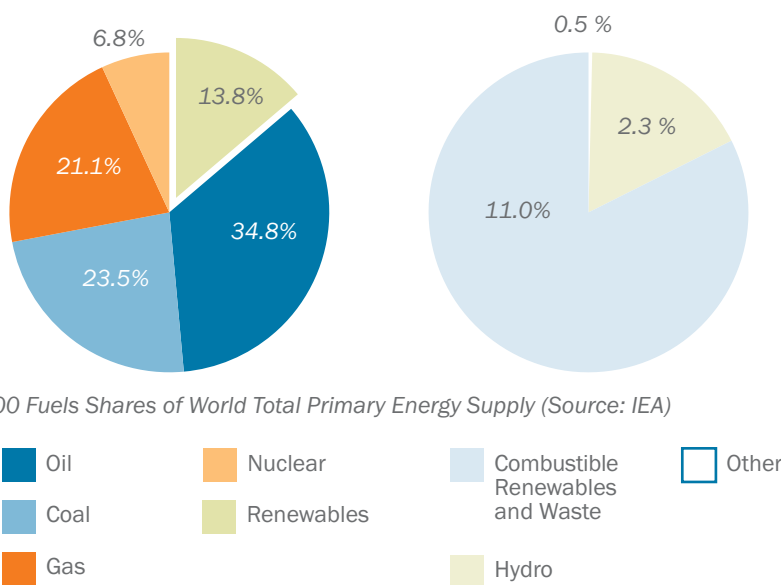
- Members of Climate Leaders Program of U.S EPA (e.g. BP, Cinergy, Ford, IBM, International Paper, PSEG, etc.);
- California Climate Action Registry Protocol;
- Chicago Climate Exchange;
- The Wisconsin Voluntary Emission Reduction Registry;
- WBCSD Working Group Cement CO₂ Protocol;
- NZBCSD's Business Opportunities and Global Climate Change;
- International Forum of Forest and Paper Associations Pulp and Paper Sector Tool;

- World Wide Fund Climate Savers;
- BLICC (Business Leaders Initiative on Climate Change);
- French REGES Protocol;
- New ISO Standard on GHG Accounting for Entity and Projects;
- Italian Study for the Definition of Guidelines for Monitoring, Reporting and Verification of Greenhouse Gases.

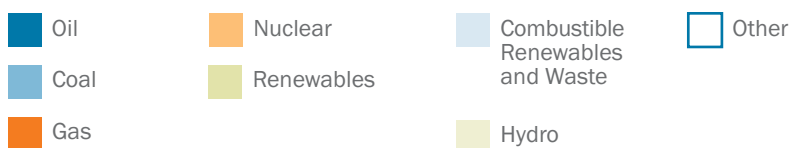
Ratifying the Kyoto Protocol and facing coming entry into force of the Protocol, it is expected that emission reporting on voluntary or mandatory basis would be one of the common regulatory developments at the national level.

4. Using and Investing Renewable Energy: Renewable Portfolio Standards or Management?

With respect to climate change and energy issues, renewable energy has been receiving attention all over the world. As is shown below, combustible renewables and waste account for nearly 80% of the renewables share, hydro for 16.5% and "new" renewables: geothermal, solar, tidal, wave, wind and other, together account for 0.5% in 2000.



2000 Fuels Shares of World Total Primary Energy Supply (Source: IEA)



Many of the governments set minimum targets for electricity generation from renewable sources. Under the concept of renewable energy certificate system (or green certificate system) there has been discussion that requires electric utility have X percentage of the supply side generation from renewables or purchase a renewable energy allowance credit in Europe and U.S.A. Members of RECS (Renewable Energy Certificate System), for example, include facilities from the following countries: Australia, Austria, Belgium and Luxembourg, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, U.S.A.

Especially the following six States of U.S.A have adopted the renewable portfolio standards (RPS) by increasing the amount of renewable energy in the overall electric source portfolio: Maine, Nevada, Connecticut, Massachusetts, New Jersey and Texas.

5. Green House Gas (GHG) Emissions Trading

GHG emissions trading will take on greater importance in 2003, and not only in Europe. Some fifty-six countries around the world are moving on a variety of initiatives to combat global climate change, including in many a variety of emissions trading schemes. These trading initiatives vary by country according to the substances to be included, the participants and whether they will be compulsory or voluntary in approach.

For many industries, such schemes may offer the most cost-effective way of reducing their GHG emissions over the medium to longer term. Although some trading schemes already exist, many are only in the pilot, or even planning stages. As more governments and markets gain experience and confidence in the schemes, it is very likely that they will spread to other countries as well. At this stage, as new emission trading schemes are being planned and implemented, energy intensive industries are being strongly encouraged to participate in the various public consultations being sponsored by governments, in order to play a positive role in influencing the shape of the future trading schemes. The following table provides an overview of some of the emission trading schemes being discussed at the moment or already implemented.

	EU	UK	FR	DE	DK	SE	NL	NL
Coverage	CO2 only	Choice CO2 or all 6 GHG	All 6 GHG	CO2	CO2	All 6 GHG	NOx	CO2
Start	Planned	4/2002	Planned 2003	Pilot: 8/2000 - 5/2001	2001	2005 or later	2001	Planned 2004 - 2005
	USA	CA-PERT	CN	JP				
Coverage	SO2	All GHG & other pollutants	SO2	CO2				
Start	Since 1994	Pilot: 1996	Pilot: 2003	Pilot: 2003				

2002-2003 Regulatory Developments

The following are regulatory developments related to Climate Change and Energy Efficiency which occurred in 2002. The overview is taken from the EPC-Update. The ID-number after each reference refers to the corresponding [database](#) record of the [EPC-Update](#). For more details on any of these developments one can subscribe to the "EPC-Update" which provides an abstract of each development. A more detailed two-page summary and analysis of each initiative is also available via this service.

	Countries/ID-Number in Enhesa Database
Climate Change General	Australia [ID 3762, ID 5280], Austria [ID 5187, ID 4518], Canada [Quebec - ID 5415, ID 5176, ID 5533], Costa Rica [ID 5645], Czech Republic [ID 5495, ID 5489, ID 5483], Denmark [ID 5317], European Union [ID 5382, ID 5171, ID 3674], France [ID 5451, ID 4850], Germany [ID 5541, ID 5159, ID 2406, ID 5113, ID 4999, ID 4982], Hungary [ID 5022], India [ID 5476, ID 2261], Italy [ID 2104], Japan [ID 5308], Mexico [ID 5537], Philippines [ID 5004], Singapore [ID 5426], Spain [ID 5579], United Kingdom [ID 4097, ID 5583, ID 4281], United States [ID 5616]
Energy Efficiency Standards and MEPS	Brazil [ID 5584], European Union [ID 5146, ID 5144, ID 4969], Finland [ID 5597], Germany [ID 4758, ID 5527, ID 5526, ID 1235], Italy [ID 5119, ID 4977], Malaysia [ID 2248], Mexico [ID 5424], Spain [ID 5446]
Building Standards	Denmark [ID 5390], European Union [ID 4432], Italy [ID 2625, ID 5124], Mexico [ID 3895], Spain [ID 2317], United Kingdom [ID 3975]
Emission Reporting	France [ID 5465], United States [ID 4992]
Renewable Energy	United Kingdom [ID 4632]
Emissions Trading	Canada [ID 5533], India [ID 5476], United Kingdom [ID 5583], Eu [ID 3207], Taiwan [ID 3832], France [ID 4850]

Web-links

The quantity of interesting information that is being made available on internet is growing every day. For the EHS Professional internet has become an important tool for finding more information on the issues of concern. The following overview of interesting websites is not intended to be exhaustive. It however is intended to point at some of the more interesting websites on Climate Change and Energy Efficiency.

UN Climate Change Site

<http://unfccc.int/index.html>

United Nations web-site on the Framework Convention on Climate Change with access to all official documents available in electronic format, essential information on the status of each Party's participation in the Convention, greenhouse gas inventory data (if available), etc.

World Energy Council

<http://www.worldenergy.org>

The World Energy Council is the foremost global multi-energy organization in the world. WEC has Member Committees in over 90 countries, including most of the largest energy-producing and energy consuming countries.

European Commission Climate Change Web-site

http://europa.eu.int/comm/environment/climat/home_en.htm

Web-site of the European Commission DG Environment on climate change issues with access to all EU documents related to the Climate Change Conferences, information on the proposed EU emissions trading scheme, etc.

Energy Star Programme

<http://www.energystar.gov/>

The Energy Star Programme was introduced by the US Environmental Protection Agency in 1992 as a voluntary labeling program designed to identify and promote energy-efficient products, in order to reduce carbon dioxide emissions. Since then, it has expanded to cover new homes, most of the buildings sector, residential heating and cooling equipment, major appliances, office equipment, lighting, consumer electronics, etc.

Renewable Energy Certificate System (RECS)

<http://www.recs.org>

RECS provides a mechanism for representing a specific instance of the production of a megawatt hour of renewable electricity by a unique certificate. RECS members have developed and adopted a set of rules to ensure that national systems are harmonized, built to the same standards and compatible with each other.

World Business Council for Sustainable Development

<http://www.wbcsd.org/>

The World Business Council for Sustainable Development (WBCSD) is a coalition of 165 international companies united by a shared commitment to sustainable development via the three pillars of economic growth, ecological balance and social progress.

The International Climate Change Partnership (ICCP)

<http://www.iccp.net>

ICCP is a global coalition of companies and trade associations from diverse industries committed to constructive and responsible participation in the international policy process concerning global climate change. The ICCP recognizes that the continued growth in emissions of greenhouse gases is an important concern for all nations and that efforts are underway internationally and in national governments to develop policies that address this concern.

The Global Environmental Management Initiative (GEMI)

<http://www.businessandclimate.org/>

GEMI is a nonprofit organization of leading companies dedicated to fostering environmental, health and safety excellence worldwide through the sharing of tools and information in order for business to help business achieve environmental excellence.