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Global Environment Outlook

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Summary for North America

On the Eve of Rio+20

North America's Renewable Energy Industry Slow to Emerge Due to Institutional Barriers, Uneven Financing, and Grid Inflexibility

Success in Cutting Sulphur Dioxide and Regional Renewable Examples Demonstrate How Policies and Clear Targets Bring Results

North America has been slow to tackle the expansion of renewable energy sources that could reduce emissions, but it can make strides in addressing this and other climate challenges by replicating and expanding successful policies.

A continued reliance on fossil fuels, particularly coal-fired power stations, and wide use of agricultural land for just eight commodity crops, to produce biofuels and to fuel North America's levels of meat consumption are major drivers of environmental pressure.

However, there have been success stories: from the near-elimination of the production and use of substances that deplete the ozone layer to cuts in sulphur dioxide emissions through a cap-and-trade emissions programme – both of which show that international goals and treaties with specific targets can be met.

Carbon taxes in Quebec and British Colombia and policies to improve the flexibility of grids to allow renewable sources more access have also helped show a move to a more sustainable path is eminently possible.

If scaled-up and accelerated, such measures could assist in a transition to a Green Economy as nations across the globe prepare for the Rio+20 Summit later this month.

The above are among the main findings for North America from the Global Environment Outlook 5 (GEO 5), which analyzes the worldwide state of the environment and tracks progress towards agreed goals and targets.

Water is often taken for granted, with the region having the highest water footprint in the world, despite threats from droughts and floods, dams and river fragmentation, saltwater intrusion, and agricultural pollution.

However, policies and innovative market-based instruments are becoming more successful in improving environmental conditions.

Case studies from states and provinces show that strong and focused policies can lead to rapid expansion of renewable energy production, but development has been uneven. Policy regimes are not adequate to produce the shift to a sustainable energy system, thus reducing greenhouse gas emissions, even though transferring and scaling up successful processes will help achieve internationally agreed environmental goals.

On a regional level, GEO 5 pays particular attention to policy approaches, highlighting successful national and regional policies that can be scaled-up and replicated elsewhere. Emerging trends and regional priorities for action are also explored.

Drivers

Central to the GEO 5 methodology is the concept that environmental pressures can only be effectively tackled if underlying drivers are addressed. Policies are most effective, argues the report, when they proactively address the causes of environmental degradation, rather than reacting to the effects.

Population, Urbanization and Economic Development

According to UN figures, over 80 per cent of the North American population live in cities. This population has a large impact: according to 2006 research, the inhabitants of a city of 650,000 in the US require three million hectares of land to meet their needs, compared to 280,000 hectares for an Indian city around the same size.

The US economy shrunk by 5.1 per cent during the 2007-2009 recession, according to the US Bureau of Economic Analysis, but it remains the world's largest economy with a 2011 Gross Domestic Product (GDP) of over US$15 trillion.

Consumption growth has tailed off: the annual increase in kilocalories consumed per person per day fell from close to 4 per cent to under 3 per cent in 2007. However, consumption patterns, particularly a reliance on a small group of commodity crops and a heavy focus on meat – North Americans eat an average of 83kg per year – means even a small increase has negative impacts on land use, emissions and waste.

Energy

Research shows that increasing renewable energy globally could cut out 85 per cent of all carbon dioxide emissions by 2050, but North America has been slow to shift from fossil fuels despite abundant renewable energy resources.

Patterns of Globalization and Transport

The US' status as the world's largest importer has a major impact. Between 2002 and 2007, for example, 8 to 12 per cent of China's CO2 emissions were attributable to exports to the US. Countries and regions are specializing in their attempts to become competitive, leading to exports (fruit to North America as one example) and a greater demand for transport, which relies heavily on fossil fuels.

State of the Environment - Priority Issues

During regional preparatory consultations for GEO 5, four priority environmental issues were identified for North America: Environmental Governance, Energy, Land and Freshwater. Climate Change was selected as a cross-cutting issue.

Environmental Governance

Environmental governance in North America is characterized by federal political systems, ideological flux, evolving socio-economic constraints, and the dynamics of environmental issues as well as the knowledge associated with them.

The Nusa Dua Declaration (UNEP GC 2010) Paragraph 13, which calls for the advancement of the concept of a green economy in the context of sustainable development and poverty eradication, was selected as the key goal in this area.

- Federal governments are no longer the primary leaders in setting the policy agenda or devising innovative policy instruments, yet they remain essential to the ultimate success of those policies, help ensure harmonization across jurisdictions and prevent the development of environmental inequities

- There is a strong tendency to favour market-based instruments because of early successes, with evidence that some have succeeded in changing behaviour, and to overlook traditional regulatory instruments

- Relative federal disengagement has opened the door to policy initiatives and innovations at the sub-national levels of states and provinces or municipalities, as well as to regional trans-border cooperation.

The report recommends that governments promote policies in the main areas of market mechanisms, such as cap-and-trade and payment for ecosystem services programmes, command-and-control mechanisms, such as carbon taxes, and increased transparency and accountability.

However, there is a need for more empirical data to show the effectiveness of market-based instruments, and this approach needs a clear and strong regulatory framework to work well.

CASE STUDY: The Quebec and British Columbia Carbon Taxes

In 2007, Quebec became the first North American state or province to introduce a carbon tax. Energy companies are required to pay 0.8 cents for each litre of petrol distributed in Quebec and 0.938 cents for each litre of diesel. The revenue-neutral carbon tax in place in British Columbia since 2008 is more ambitious. Rate increases were phased in: US$10 per tonne of CO2-equivalent in 2008 up to US$30 a tonne in 2012. The comprehensive tax applies to all emissions from fossil fuels, accounting for 70 per cent of the province's emissions.

Energy

North America continues to be heavily dependent on fossil-fuels, showing reluctance to switch over to renewable energy sources in a cohesive or coherent manner.

The international goal of urgently increasing renewable energy resources - Johannesburg Plan of Implementation (JPOI) (WSSD 2002) Paragraph 20e - was selected to address the challenges of fossil fuel combustion's contribution to climate change, elevated water consumption and air pollution.

Coal-fired plants continue to be the largest single source of power in the US - the second-largest producer of coal in the world at 975 million tonnes per year. According to the Environmental Protection Agency (EPA), 2010 US greenhouse gas emissions rose 3.2 per cent from 2009 levels to 6,821.8 million metric tons CO2 Equivalent as the economy recovered, bringing an increase in energy consumption.

In addition, hydraulic fracturing has made gas extraction from shale formations economically viable, leading to potential land fragmentation and degraded air and groundwater quality. The switch to fossil fuels like shale gas is likely to exacerbate climate change as methane emissions are at least 30 per cent higher than from conventional gas.

Greatly increasing the use of renewable energy in North America is technically feasible and can provide multiple benefits including reduction of greenhouse gas emissions, lower energy prices and decreased market volatility, while creating new employment and economic opportunities.

The report recommends action in three different policy areas to boost the adoption of renewable energy: the provision of financial support to alter incentives or encourage behavioural change, the improvement of networks and grid flexibility and the lowering of institutional barriers.

CASE STUDY: Energy Policies to Improve Networks and Grid Flexibility

Renewable energy sources and fossil fuel generation facilities are often located far apart, requiring networks to transport energy from new source areas to load centres. In addition, fossil fuel generation, characterized by long-term capital stock, currently dominates the market, limiting opportunities for new technologies to enter.

Several policies have been devised to improve the management and characteristics of transmission networks and increase market access and space. This is achieved by designating transmission cost recovery and allocation; managing the grid through independent system operators; developing smart grids; and phasing out coal plants.

Land

Land use presents both environmental concerns and potential for sustainable development in North America, yet one of the most important obstacles to sustainable land use is the fragmentary nature of land management.

The Johannesburg Plan of Implementation (JPOI) (WSSD 2002) Paragraph 40b, which calls for the development of integrated land management and water-use plans, was selected as a key goal for this issue.

More than two million people in the US work in or support the forestry and agriculture industries, while in Canada, GDP for agriculture, forestry, fishing and hunting totalled US$24.7 billion in 2010.

Some 74 per cent of US agricultural land is dedicated to eight commodity crops: corn, wheat, cotton, soybeans, rice, barley, oats and sorghum. Also, a disproportionate share of land is dedicated to meat and dairy production. The amount of grain fed to livestock in the US is estimated at over seven times that consumed directly by the population.
These and other factors, such as fossil fuel extraction and urban development, apply significant pressure on land and often result in conflicts over its use.

Biofuel markets and the demand for meat in refined North American diets make changes in farming systems difficult. However, the Conservation Reserve Program (CRP) helps, paying farmers to withdraw land from production to restore soils, and providing benefits estimated at US$1.3 billion per year.

Yet demand for biofuels has caused setbacks. In 2007, US farmers planted 37.8 million hectares of maize, the largest area since 1944. This subsidized move resulted in the total area of CRP land dropping from 14.9 million to 13.6 million hectares between late 2007 and March 2009.

The report recommends the following policy approaches to deal with issues of land use: implementing integrated land management plans to encourage and enable sustainable resource use, incorporating the true costs and benefits of ecosystem services when developing policy mechanisms, and improving planning for and sustainability of public lands.

CASE STUDY: Pricing of Externalities and Integrated Land Management

Jurisdictions throughout the region have adopted many of these policy instruments to different degrees. In British Columbia, Canada, resource companies, environmental groups and coastal First Nations carried out an ecosystem-based integrated land-use planning exercise: the 2006 Great Bear Forest Agreements. Taxes and other incentives in the US have increased the total area conserved by trusts to around 15 million hectares, and payment for ecosystem service programmes preserved another 92 million.

Freshwater

Because of its relative high quality and abundance, water in North America is often taken for granted, although more recently there is recognition that significant water conflicts exist.

The Johannesburg Plan of Implementation (JPOI) (WSSD 2002) Paragraph 26c, which calls for the efficient use of water resources and sensible allocation among competing sectors, was selected as a key goal for this issue.

Global water withdrawals have tripled over the past 50 years and North America has the highest footprint at 2,798 cubic metres per person per year – double the average. The United States and Canada respectively contain six and five per cent of global renewable water resources, ranking third and fourth overall.

Freshwater issues that remain a challenge in some parts of the region include droughts and floods, dams and river fragmentation, saltwater intrusion, contamination caused by hydraulic fracturing for natural gas extraction and non-point source pollution from agricultural. Eutrophication - excessive nutrient supply from human activities - is a pervasive water quality problem. Under severe eutrophic conditions, algal blooms can produce hypoxic conditions, killing fish in lakes.

The energy sector is believed to account for approximately 40 per cent of total water withdrawals in the US and European Union, while agriculture accounts for 92 per cent of the global water footprint. Many agricultural centres, particularly the Midwestern and Western in the US, are dependent on groundwater, which is seeing growing depletion rates.

The three policy areas the report identified where concerted action can make a difference to this issue in North America are integrated watershed management, full-cost pricing and technological solutions.

CASE STUDY: The Great Lakes and St Lawrence Cities Initiative

This initiative set a goal that all participating cities by 2015 reduce water use by 15 per cent below 2000 levels. By 2010, almost half of the 33 participating cities had collectively achieved a 13 per cent reduction, conserving a total of 330 million cubic metres of water.

Other Issues

Atmosphere

In line with the Montreal Protocol, the world has nearly eliminated the production and use of substances that deplete the ozone layer. In the US alone, the estimated impact will be 22 million fewer cases of cataracts in people born between 1985 and 2100 and 6.3 million fewer skin cancer deaths up to 2165. The cap-and-trade emissions programme introduced in 1995 is credited with reducing sulphur dioxide emissions at a lower cost than traditional environmental regulation.

Biodiversity

In common with other regions, large-scale commercial agriculture has adversely affected biodiversity. In North America, grassland and dryland species have declined by 28 per cent and 27 per cent respectively since 1968, although wetland bird species have increased by 40 per cent due to various conservation measures.

The Way Forward

While progress in areas such as uptake of renewables has been slow, many policies and market instruments have contributed toward the achievement of internationally agreed goals. Public-private partnerships have become increasingly important as government funds and staff have proven unable to assess resources, coordinate sustainable management and accommodate the increasing demands of multiple users.

The policy options outlined in the priority areas above suggest a number of opportunities for future environmental governance in North America. Transferring and scaling up the successful processes will further speed up the achievement of internationally agreed environmental goals.

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