ACCELERATING SDG 7 ACHIEVEMENT

POLICY BRIEF 12

SDG 7 IN THE UN ECONOMIC COMMISSION FOR EUROPE REGION

POLICY BRIEF #12

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Developed by

United Nations Economic Commission for Europe (UNECE)

In collaboration with

The World Bank and the International Energy Agency (IEA)

Key Messages

The ECE region is a diverse group of 56 countries in Europe, Central Asia, and North America. The fossil fuels industry is dominant, providing just over 80 per cent of total primary energy supply, and shaping national policy approaches and energy decisions. Combined challenges related to energy efficiency, access, heating service affordability, reliability of aging systems, and future resilience require a reconfiguration of the energy industry as a complex of service industries. This could unleash innovation, investment, and improved energy productivity.

Energy access

Access to electricity in the region is at almost 100 per cent, though this figure does not reflect differences in quality and cost, or the energy poverty affecting poor and rural populations during winter months when heating is essential. The region as a whole has 98 per cent access to clean fuels and technologies for cooking. Ensuring physical and economic access to quality energy services, however, requires investments throughout the energy value chain, and government policies and regulations that address a dynamically changing energy market while also protecting vulnerable groups.

Efficiency

Most countries in the region have National Energy Efficiency Action Plans, but have shown limited progress in implementing them. Improving energy efficiency is one of the most cost-effective options for meeting growing energy demand and attaining climate commitments, and there is a largely untapped potential for energy productivity improvements in the industry and transport sectors. National policy frameworks need to eliminate policies that create market-entry barriers, artificially lower energy prices (encouraging wasteful consumption), or maintain production and consumption subsidies that distort markets.

Renewable energy

Renewable energy represented 12 per cent of total final consumption in 2016 (11 per cent in North America, 17 per cent in Western and Central Europe, 24 per cent in Southeast Europe, and 5 per cent in Eastern Europe, the Caucasus, and Central Asia). The region has almost half of the world's installed renewable electricity capacity (869 gigawatts in 2016), close to half (388 GW) from large hydropower stations, 254 GW from wind, and 140 GW from solar photovoltaic systems.

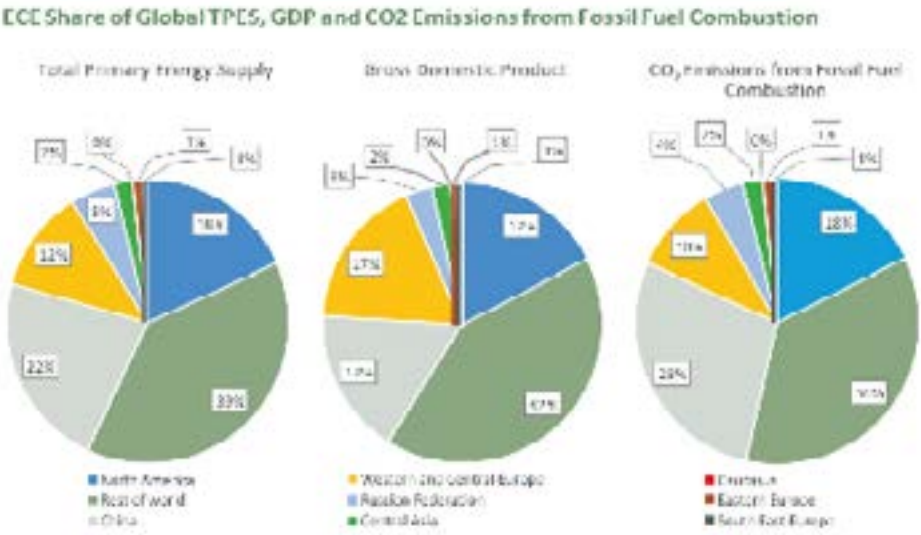
Most ECE member states have adopted renewable energy promotion policies for electricity and heating. For electricity, these include feed-in tariffs (FiTs) or premiums, tax reductions, investment incentives, and, recently, auction mechanisms to reduce the cost of introducing renewable energy. Promotion schemes within the heating sector are mostly used to encourage heat generation from solar thermal energy, followed by biogas/biomass and geothermal energy.

As renewable energy resources are become more cost-competitive, they offer a way to reduce the net carbon intensity of the energy sector, improve energy security, and encourage economic development. Wider uptake of renewables requires addressing barriers to fair competition against conventional technology (without long-term subsidies), implementing stable long-term energy policy frameworks for the future, and deploying innovative and targeted financial mechanisms.

Fossil fuel dependence creates challenges for meeting the 2030 climate objectives. Efforts to decarbonise the system risk aggravating regional energy poverty issues and need to take into account 'just transition' solutions, as well as energy security concerns (energy independence vs. integrated regional grids). New types of energy concerns are also arising due to increasing penetration of digital technology throughout the energy system (hacking, terrorist attacks) and with intensification of climatic events (fires, hurricanes, and rising oceans). These risks create an added imperative to address the challenge of resilience in terms of both planning and recovery.

Status of SDG7 in the ECE region

The ECE region comprises 56 countries with a population of 1.26 billion, or 17 per cent of the world's population. The region has four sub-regions: North America; Western and Central Europe; Southeast Europe; and Eastern Europe, Caucasus, and Central Asia. It is diverse, with high-, middle-, and low-income countries, countries with economies in transition, energy-rich countries, and others with few indigenous energy resources. In 2016, the region accounted for 41 per cent of global gross domestic product (GDP), 39 per cent of the world's total primary energy supply, and 36 per cent of carbon dioxide (CO2) emissions.



Energy access

The region has achieved close to 100 per cent physical access to electricity networks. As noted in the previous tracking report, ageing infrastructure, a lack of supply diversity, and increasing tariffs have led to poor power quality and, for some, energy poverty. This situation is particularly acute during the cold winter months in the Northern hemisphere, and disproportionately affects poor and rural populations.

Human comfort and safety depend on substantial heating services in most ECE countries, a reality not reflected in the statistics on electricity network access. There remains a significant challenge of older, inadequately insulated housing stock locked in to fossil fuel dependence. Many households spend more than 10 per cent of their income on energy.

The region as a whole had achieved 98 per cent access to clean fuels and technology for cooking by 2014, up from 95 per cent in 2000, but access is not homogenous across the region. North America, Europe, and the Russian Federation have achieved the highest levels of access to clean cooking fuels, but countries in the Caucasus and Central Asia regions still have people living in remote places and still rely on traditional fuels for cooking. The rate of access in the sub-region remains at 92 per cent.

Energy efficiency

Improvements in energy intensity continued in 2015 and 2016 at rates between -1.6 per cent (Southeast Europe) and -2.6 per cent (Western and Central Europe). The regional averages mask several countries in

which energy intensities increased, in some cases significantly (e.g., Sweden at +4.9 per cent and Bosnia and Herzegovina at +6 per cent). It must be noted that the energy intensity data do not reflect only progress on energy efficiency but also both cyclical and sustained shifts in economic sectors.

As noted in the previous tracking report, most countries in the region have National Energy Efficiency Action Plans, but have shown limited progress in their implementation. Improving building energy performance is slow, though there has been solid appliance efficiency progress in North America and the countries in the European Union. A largely untapped potential for energy productivity improvement in industry and transport exists across the region.

Renewable energy

Renewable energy in the ECE region grew to 12 per cent of total final consumption in 2016, with 11 per cent in North America, 17 per cent in Western and Central Europe, 24 per cent in Southeast Europe, and 5 per cent in Eastern Europe, the Caucasus, and Central Asia.

The ECE region had an installed renewable electricity capacity of 869 gigawatts (GW) in 2016, accounting for almost half of the world's installed renewable electricity capacity (1,971 GW, excluding pumped and mixed hydropower). Hydropower is the most established renewable energy technology for electricity generation, making up 412 GW (of which 388 GW was installed at large hydropower stations) of total renewable electricity capacity. Wind energy and solar photovoltaics (PV) are the second and third largest renewable energy electricity markets, with installed capacities of 254 GW and 140 GW, respectively. These two markets are also showing the most dramatic growth. Between 2013 and 2016, the compound annual growth rate for the wind energy market was 7.6 per cent, and 10.3 per cent for the PV market.

Most ECE member States have adopted renewable energy promotion schemes—49 member States have schemes in the electricity sector and 41 member States have them in the heating sector. In the electricity sector, the most widely established renewable energy promotion schemes are feed-in tariffs (FiTs) or premiums, tax reductions and investment incentives. More recently countries have been introducing auction mechanisms to reduce the cost of introducing renewable energy. Each of these policy instruments is in place in more than 40 ECE member States. Promotion schemes within the heating sector are mostly used to encourage heat generation from solar thermal energy, followed by biogas/biomass and geothermal energy.

Policy implications

Countries in the ECE have divergent economic development, resource availability, and energy mixes embedded in their national energy strategies. As a consequence, multiple national approaches and outcomes are found.

Existing infrastructure, including the physical, regulatory, policy, and organizational infrastructure of the energy industry, is shaping policy approaches and national energy decision making. There is evidence in the ECE region of challenges in heating service affordability, the reliability of aging systems, and future resilience needs. Truly transforming the energy system will require a creative shift in policy and regulation to unleash innovation, investment, and improved energy productivity. Yet, in many countries in the region, the current political, institutional, regulatory, and physical infrastructure are not yet ready for such a transformation.

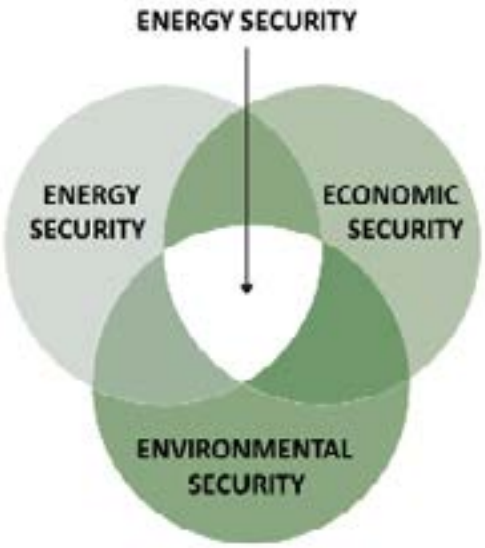
Fossil fuel dependency:

Fossil fuels dominate the region's energy mix and underpin today's energy access and economic development. The locked-in dependency on fossil fuels is a major challenge for any transformation as the social and economic fabric of many countries or regions within countries are based on activities linked to

fossil energy, and deep transformation will have enormous consequences. Beyond employment and the delivery of quality of life, energy can be critical for national incomes, balances of trade, and other geopolitical positioning. The TPES of ECE countries is just over 80 per cent fossil energy.

Climate commitments:

Given the region's dependence on fossil fuels, meeting the 2030 Agenda's climate objectives must be integrated with the remainder of the agenda to achieve the aspired decarbonisation of the future energy system. Inasmuch as energy poverty already is an issue in ECE member States, policies to attain climate commitments risk aggravating the issue. Integrated solutions, including "just transitions," require clear understanding of the climate-related impacts of energy in connection with the development-related opportunities that energy represents. The two most relevant GHGs from the energy sector are CO_2, mainly from the combustion of fossil fuels, and methane emissions along the coal and gas value chains. The ECE region also is falling short on the relevant indicators for these emissions.



Energy security:

Some countries and sub-regions promote energy independence or self-sufficiency as a means to ensure their energy security, while others strive for efficient integration of energy markets. For the ECE region as a whole, promoting mutually beneficial economic-interdependence would accelerate attainment of the 2030 Agenda through integrative, nexus solutions that the notion of sustainable development offers. For energy, it is critical to think in terms of a wholly interconnected, complex system in which supply, demand, conversation, transport, and transmission interact freely and flexibly. Ensuring energy security as part of the ongoing deep transformation creates an imperative to mobilize needed investment in the energy system of the future that is rational and pragmatic socially, environmentally, and economically.

The concepts of energy security evolved over time from security of supply to a broader view of energy security embracing supply, demand, and transit. However, with increasing penetration of digital technology throughout the energy system and with intensification of climatic events, the energy system is exposed to new risks of either human or natural origins (hacking, terrorist attacks, or natural events like forest fires, hurricanes, and rising oceans). These risks create an added imperative to address the challenge of resilience in terms of both planning and recovery.

Constrained optionality:

Certain options for improving the overall performance of today's energy system are excluded in the

formulation of some national sustainable energy strategies for reasons of public perception, politics, imposed market distortions, or legitimate but possibly solvable concerns of safety or environment. Including them in the future would improve the potential to meet the 2030 Agenda.

Energy as a service, not energy as a commodity:

The energy industry has succeeded in raising quality of life around the world, most notably in the advanced economies but even in the developing world. The energy industry today is a commodity business in which players earn returns by producing and selling more. The existing infrastructure, including the physical, regulatory, policy, and organizational infrastructure of the energy industry, is shaping decisions about the future inasmuch as today's structures are expected to persist in the future. And yet consumer energy services are inadequate. There is evidence in the ECE region of challenges in energy efficiency, energy access, heating service affordability, the reliability of aging systems, and future resilience needs. What is needed for true sustainability is to reconceive the energy industry as a complex of service industries. Such a reconfiguration would unleash innovation, investment, and improved energy productivity. Truly transforming the energy system will require a creative shift in policy and regulation, yet in many countries the current political, regulatory, and industrial infrastructure is not yet ready for such a transformation.

Equitable access to modern energy services requires mobilising adequate resources:

Ensuring physical and economic access to quality energy services requires investment throughout the energy value chain, from primary energy development to end use. Enabling investment requires that governments have a long-term vision for providing sustainable energy services, and that they promulgate sustainable policies and regulations that allow producers and consumers to respond to a dynamically changing energy market. Such a vision should include provision of access to modern energy services for vulnerable groups as part of national poverty reduction strategies and social development policy.

Improving energy efficiency is one of the most cost-effective options for meeting growing energy demand and attaining climate commitments in most countries

Significant potential for improving energy efficiency exists in the ECE region, but attempts to improve energy efficiency often fall short because of flawed national policy frameworks: policies that artificially lower energy prices encourage wasteful consumption; production and consumption subsidies distort markets, housing stocks are poorly managed, land use management is inefficient, new participants face barriers to entry, there are inadequate norms and standards, and the statistics and information to manage energy use and track progress are incomplete. In addition, there is often a lack of public awareness and education about the long-term economic and social benefits of action to improve energy efficiency and productivity.

Renewable energy policies need to be redesigned

Renewable energy resources are becoming cost-competitive in comparison to conventional resources. They offer a way to reduce the net carbon intensity of the energy sector, improve energy security, and encourage economic development. Integrating renewables into the global energy mix will be important as future energy systems are optimized both on- and off-grid. However, wider uptake of renewables requires addressing barriers to fair competition vis-à-vis conventional technology (without resorting to long-term subsidies), implementing stable long-term energy policy frameworks in a future energy system context, and deploying innovative and targeted financial mechanisms. Policies should be designed in light of the economic circumstances and development challenges of countries with renewable energy potential.

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HIGH-LEVEL POLITICAL FORUM
ON SUSTAINABLE DEVELOPMENT

7 AFFORDABLE AND CLEAN ENERGY