

SOUTH KOREA

Country at a glance

- Population: 48.4 million (2010) [1]
- Total area: 99,720 sq. km [2]
- Carbon emissions per capita: 11.63 metric tons (2010) [3]
- Energy consumption per capita: 60.1 MWh (2010) [4]
- Percentage of global carbon emissions: 1.86% (2010) [3]



Birds-eye view of the Daecheong Dam in South Korea. Permission Under CC BY-NC 3.0 License
en.wikipedia.org/wiki/File:Daecheong_Dam.jpg

Hydroelectric power station at the Daecheong Dam in South Korea

Located at the Geum River, the Daecheong dam was completed in 1980. It stands as one of the oldest hydroelectric facilities of the country with an installed capacity of 90 MW. Besides electricity generation, the dam is also designed for flood control protection and water supply for nearby areas.

Table 1 Breakdown of energy use, electricity and heat generation, 2010

	Primary energy sourced within country		Energy imports minus exports	Primary energy used within the country ^(a)			Electricity Generation ^(b)		Heat Generation ^(c)		
	unit	ktoe		%	ktoe	GWh	%	GWh	%	GWh	%
Coal, including brown coal & peat		959	2	72,949	73,426	853,942	29	219,276	44	14,817	28
Oil fuels		698	2	108,802	95,115	1,106,184	38	18,935	4	14,643	28
Natural gas		485	1	39,279	38,672	449,757	15	103,184	21	17,158	33
Nuclear		38,725	86	0	38,725	450,372	15	148,596	30	0	0
Hydroelectric		317	1	0	317	3,683	0	3,682	1	0	0
Biofuels and waste		3,430	8	18	3,448	40,103	1	1,107	0	5,584	11
Solar photovoltaics		66	0	0	66	772	0	772	0	0	0
Solar thermal		29	0	0	29	340	0	0	0	0	0
Tide, wave and ocean		0	0	0	0	0	0	0	0	0	0
Wind		70	0	0	70	817	0	817	0	0	0
Geothermal		33	0	0	33	389	0	0	0	0	0
Electricity (imported)		0	0	0	0	0	0	0	0	91	0
Sub total Renewables		3,946	9	18	42,689	46,104	2	6,378	1	5,584	11
Totals		44,813	100	221,047	249,902	2,906,359	100	496,369	100	52,294	100

Source: Based on World Energy Statistics and Balances Database 2012, "World Energy Balances." © OECD/IEA, 2012.

Notes:

Standard conversion used is 1 ktoe = 11.63 GWh

- (a) Sum of energy sourced within country, energy imports minus exports, international marine and aviation bunkers and stock change flows.
- (b) Includes all electricity generation, including any exported.
- (c) Does not include electrical heating. Includes waste heat recovery from electricity generation plants.

Table 2 Breakdown of transport fuel use

(in ktoe)	Total transport mix	%	Domestic aviation	Road	%	Rail	Pipeline transport	Domestic navigation	Non-specified (transport)
Oil products	28,402	95	340	27,116	95	184	1	674	88
Natural gas	1,023	3	0	1,023	4	0	0	0	0
Biofuels and waste	300	1	0	300	1	0	0	0	0
Electricity	188	1	0	0	0	188	0	0	0
Sub total Renewables	300	1	0	300	1	0	0	0	0
Total	29,914	100	340	28,439	100	373	1	674	88

Source: Based on World Energy Statistics and Balances Database 2012, "World Energy Balances." © OECD/IEA, 2012.

Stand on climate change

South Korea signed the UNFCCC in 1992, and ratified it in 1993. In 1998, South Korea signed the Kyoto Protocol, and later ratified it in 2002. The country has pledged to reduce national greenhouse gas emissions by 30% from business as usual (BAU) by 2020. This goal is in line with the substantial deviation from the baseline of Non-Annex I countries indicated in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Since Korea is a Non-Annex I country under the Kyoto Protocol, this is considered to be a challenging goal and one which sets a meaningful example for other developing countries [5].

As a member of the UNFCCC, South Korea actively pursues voluntary, multilateral policies and measures in several sectors, in order to contribute to the international joint effort to find a solution to the global issue of climate change. In 1998, with the Prime Minister as the head, South Korea has organized and operated the Special Committee on Climate Change (also known as the Inter-Ministerial Committee on Climate Change) [5]. The Comprehensive Action Plans for Climate Change 2008 – 2012 (preceded by the Comprehensive Action Plans for UNFCCC) resulted from the Special Committee on Climate Change [6].

In 2012, lawmakers passed a cap-and-trade legislation despite industry opposition, giving Korea the third mandatory, national-level cap-and-trade programme in the Asia-Pacific region after New Zealand and Australia. The separate Greenhouse Gas and Energy Target Management System is scheduled to start this same year, mandating emission reduction targets to some 470 firms that account for 60% of South Korea's greenhouse gas emissions [7].

National climate change programmes

South Korea's flagship legislation on climate change is the Framework Act on Low Carbon Green Growth. The purpose of the Act is to promote the development of the national economy by laying down the foundation necessary for low carbon discharge and green growth by utilizing green technology and green industries as new engines for growth. The aim is to pursue harmonized development of the economy and environment and contribute to the improvement of the quality of life of every citizen. The Act came into effect on 14 April 2010 [8].

The action plans for green growth include reductions of greenhouse gases; improvements in energy security; improvements in adaptive capacity for climate change; development of green technologies; greening of industries; sustainable development through advancement of industrial structure; greening of national and built environments; initiatives to change consumption patterns; and the enhancement of global partnerships for low carbon green growth [8].

Korea's Energy Vision 2030, a governmental plan launched in November 2006, sets an ambitious target of reducing energy intensity by 46% between 2007 and 2030. The "3 Es" dictate the direction of the national energy policy until 2030: energy security, energy efficiency, and environment-friendly. It also sets a target of 11% renewable energy out of the production portfolio by 2030, and allows all households to access affordable energy [10].

Residential-Commercial Sector

- The *1 Million Green Homes* project will replace the current energy supply with new and renewable energies such as solar photo-voltaic (PV) and geothermal energy by 2020 [5].
- Under the scheme, the Government aims to increase the number of green homes to 1 million by 2020 from the current number of 62,000 [9].
- Low energy eco-friendly home construction standard and performance established in 2009 for Joint homes [5].
- Government buildings and public facilities will be subject to further guidelines for new and renewable energy use and the number of such facilities is expected to increase to 11,000 by 2020 from the current 1,845 facilities.

Under new guidelines, these buildings must derive 5% of their energy use from new and renewable energy sources [9].

- Private buildings who meet renewable energy requirements will be awarded a building energy certificate attesting to the contribution to the national effort to reduce CO₂ [9].
- Energy efficiency grades (1-5) are labelled on 24 items including refrigerators and washing machines. The *Energy-efficiency Standard and Labelling Programme* prohibits the production and sale of items below grade 5 in Korea [5].
- All electronic products produced after 2010 for sale in South Korea are required to meet a standby energy flow of below 1W. Products that fail to meet the requirement will be labelled with a warning label [5].
- Increased insulation standards for new buildings by 20% or more [5].
- Enhanced insulation policies and technological standards for low-carbon houses by 2017, and the establishment of a Net Zero Carbon House by 2025 [5].
- Tax relief on building registration for eco-friendly and energy-saving buildings. Incentives for greening buildings also include more flexible standards such as landscaping, height, and registration tax reliefs [5].

Industrial Sector

- The number of green industrial complexes, equipped with state-of-the-art resource management systems to minimize energy, water, and emissions of residuals and CO₂, is to be increased from 5 to 10 by 2013 [9].
- A cluster of robotics, information technology (IT), and communication technologies will increase their contribution to the green economy by way of expanding their export potential, e.g. the robotics industry expects to increase its share in the world market from 8.9 to 13.3%.

Transport sector

- Mandatory fuel efficiency standards were implemented in 2012. The target for this standard was to achieve 17 kilometers per litre (and 140gCO₂/km) by 2015. The standards will be phased-in over a three-year period with the first year in 2012 requiring 70% of the target to be realised [9].
- Incentives promoting the purchase of hybrid cars and subcompacts include registration fee exemptions, tax deductions, and parking and toll fee discounts.
- Exclusive bus lanes have been implemented, and are to be expanded and integrated with subway lines.
- Goal to increase the share of mass transit in urban transportation to 55% by 2013 from 50% in 2010 [8].
- A renewable fuel standard for transport energy is under deliberation [9].
- Expansion of the Intelligent Transportation System (ITS) to 25% of paved roads by 2020 [5].

Energy sector

- South Korea has a target of increasing the proportion of renewables by 11% by 2030 [5].
- South Korea adopted the Third Basic Plan for New and Renewable Energy Technology Development and Dissemination for the period 2009 – 2030, setting the share targets for new and renewable energy at 4.3% in 2015, 6.1% in 2020, and 11% in 2030 [11].
- Feed-in-tariff programmes provide guaranteed rates for 15 years for wind and photovoltaic power generation [8].
- In 2011, a GHG and Energy Target Management Scheme was implemented to assign a GHG emission cap to the GHG emitters that exceed legally-determined thresholds. This scheme is expected to cover about 90% of industrial GHG emissions, and 70% of the total national GHG emissions [5].
- Specifically, under the GHG and Energy Target Management Scheme, the Government established a maximum allowance for annual GHG emissions for businesses emitting more than 125,000 t CO₂e of GHG, or facilities emitting more than 25,000 t CO₂e (2012 as the standard). Fines will be imposed on businesses when standards fail to be met [5].
- Businesses that have an annual energy consumption of over 2,000 TOE are encouraged to enter into voluntary agreements and set targets. This is an increase from the previous limit of over 5,000 TOE, and thereby covering a larger range of businesses. Under this scheme, businesses will voluntarily set and actualize their energy-saving and GHG reduction goals [5].
- Industries with annual energy consumption of over 2,000 TOE are required to comply with a mandatory energy audit every five-years while industries that consume over 200,000 TOE will be partly audited every three-years. [5].
- Long-term low interest loans and tax support is given for investment in energy-efficient facilities [5].
- Biofuels are being developed through oil pilot projects, marine plants and biodiesel derived from animal fats [5].

- Biodiesel was given tax exemption in 2011 and the Government is further adopting a Renewable Fuel Standard (RFS) to cover biofuels by 2012 [5].

Ministries involved in climate change/energy policy making:

Ministries involved	Web links
Ministry of Environment	eng.me.go.kr/main.do
Ministry of Trade, Industry & Energy	www.mke.go.kr/
Ministry of Land, Transport, and Maritime Affairs	energy.korea.com/
Ministry of Security and Public Administration	www.mospa.go.kr
Ministry of Foreign Affairs	www.mofat.go.kr/
Korea National Diplomatic Academy	www.knda.go.kr/english/about/chancellor/greetings/index.jsp
Korea Ship Safety Technology Authority	www.kst.or.kr/

Education institutes involved in climate change/energy policy making:

Education Institutes involved	Web links
Korea Energy Economics Institute	www.keei.re.kr/main.nsf/index.html
Korea Environment Institute	www.unep.ch/etb/areas/kei.php
University of Korea	www.korea.edu/
Keimyung University	www.kmu.ac.kr/main.jsp
Global Green Growth Institute	ggi.org/
Greenhouse Gas Inventory & Research Center of Korea	www.gir.go.kr/eng/main.do?language=en_US
Korea Institute of Industrial Technology	eng.kitech.re.kr/
POSCO Research Institute	www.posco.com/homepage/docs/eng2/jsp/family/s91a1001020c.jsp?family=0530NC&cFamily=G
Korea Environment Corporation	www.keco.or.kr/02en/
Green Technology Center Korea	www.gtck.re.kr/

References

- [1] "World Population Prospects: The 2010 Revision." Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.
- [2] "CIA - The World Factbook." Available at:
<https://www.cia.gov/library/publications/the-world-factbook/geos/ja.html>. [Accessed: 17-Jul-2013].
- [3] CO₂ Emissions from Fuel Combustion Statistics database 2012, "Indicators for CO₂ emissions." © OECD/IEA, 2012.
- [4] World Energy Statistics and Balances database 2012, "World Energy Balances." © OECD/IEA, 2012.
- [5] "Korea's Third National Communication under the United Nations Framework Convention on Climate Change: Low Carbon, Green Growth", Republic of Korea, 2008.
- [6] Prime Minister's Office, "Comprehensive National Action Plan for the Framework Convention on Climate Change", Seoul, 2008.
- [7] "Climate Change Solutions: Frontline Perspectives from Around the Globe – Climate Policy & Emissions Data Sheet: South Korea", Yale Center for Environmental Law & Policy, Webinar Series
http://envirocenter.yale.edu/uploads/pdf/South_Korea_Climate_Policy_Data_Sheet.pdf [Accessed 7-Oct-2013]
- [8] "Framework Act on Low Carbon, Green Growth", Office of the Prime Minister, 2010
<http://www.law.go.kr/LSW/lsInfoP.do?lsiSeq=98467&urlMode=engLsInfoR&viewCls=engLsInfoR#0000> [Accessed 7-Oct-2013].
- [9] Lee, Hoesung and Oh, Jin-Gyu, "Integrating Climate Change Policy with a Green Growth Strategy: The Case of South Korea", in Wakefield, Bryce (ed.), "Green Tigers: The Politics and Policy of Climate Change in Northeast Asian Democracies", Asia Programme Special Report, No. 144, Woodrow Wilson International Center for Scholars, 2010.
- [10] "South Korea's Climate Change Laws", Responding to Climate Change, 2013
<http://www.rtcc.org/2013/03/01/south-koreas-climate-change-laws/> [Accessed 7-Oct-2013]
- [11] Ministry of Knowledge Economy, "Third Basic Plan for New and Renewable Energy Technology Development and Dissemination (2009-2030)", Seoul, 2008.



Contact us at contact@aeepn.com

Compiled by:

Melissa Low