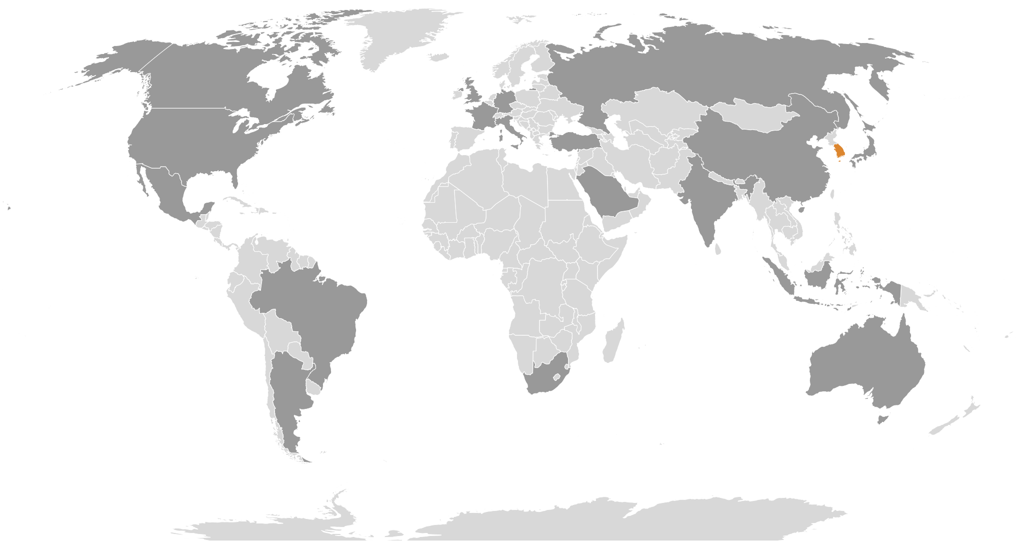
G20 subsidies to oil, gas and coal production: Republic of Korea

Alex Doukas



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This country study is a background paper for the report **Empty promises: G20 subsidies to oil, gas and coal production** by Oil Change International (OCI) and the Overseas Development Institute (ODI). It builds on research completed for an earlier report **The fossil fuel bailout: G20 subsidies to oil, gas and coal exploration**, published in 2014.

For the purposes of this country study, production subsidies for fossil fuels include: national subsidies, investment by state-owned enterprises, and public finance. A brief outline of the methodology can be found in this country summary. The full report provides a more detailed discussion of the methodology used for the country studies and sets out the technical and transparency issues linked to the identification of G20 subsidies to oil, gas and coal production.

The authors welcome feedback on both this country study and the full report to improve the accuracy and transparency of information on G20 government support to fossil fuel production.

A Data Sheet with data sources and further information for Korea's production subsidies is available at:
http://www.odi.org/publications/10081-g20-subsidies-oil-gas-coal-production-republic-korea

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Country Study
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Background

The Republic of Korea (Korea) has limited and declining oil, gas and coal reserves, yet the country is a major energy consumer, ranking as the ninth largest primary energy consumer in the world. As a result, Korea relies on imports for about 96% of the energy it consumes (KEEI, 2014), ranking as the third largest global importer of oil, the sixth largest importer of natural gas, and the fourth largest importer of coal globally (EIA, 2014). Petroleum accounts for 41% of Korea's primary energy consumption, with coal coming second at 28%, natural gas at 17%, nuclear at 12%, and hydroelectricity and other renewables accounting for less than 2% as of 2012 (EIA, 2014).

Despite limited public spending on oil, gas and coal production domestically, as with Japan, Korean companies are heavily invested in oil and gas exploration and development overseas to secure fossil fuel resources for the country, including through the Korea National Oil Corporation (KNOC). Korea is also a major funder of coal projects overseas, largely for coal power plants (see 'Public Finance' section below).

Domestically, in terms of downstream fossil fuel production, Korea is a major petroleum refiner, with the sixth largest refining capacity globally (EIA, 2014). The state-owned Korea Electric Power Corporation (KEPCO) controls electricity generation, transmission and distribution.

National subsidies

Due to Korea's limited domestic fossil fuel resources, national subsidies for fossil fuel production are relatively modest, compared to Korea's other support for fossil fuel production, averaging $217 million per year (Table 1). Nearly all of these subsidies went to support coal production.

The largest identified production subsidy was support for the production of coal briquettes. A suite of measures aimed at supporting production of coal briquettes, mostly in the form of a direct subsidy per unit of production, averaged $140 million annually. However, this support is expected to be completely phased out by the end of 2020 according to a pledge made by Korea as part of the G20 process to phase out fossil fuel subsidies agreed in 2009 (OECD, 2015).

The second largest measure is Korea's ongoing assumption of liabilities for coal miners, including accident compensation, treatment for occupational health issues, including black lung, and to alleviate the impact of mine closures, among other types of support (OECD, 2015).

Korea is also establishing some new subsidies for oil refining with the aim of diversifying oil supply to Korea. The government will subsidise refiners for the import of crudes from outside the Middle East by compensating them for freight differentials (Lee, 2014). While the measure was expected to begin in September 2014, no data is available on the cost of the measure to date.

Table 1: Korea's national subsidies to fossil fuel production, 2013–2014 ($ million except where stated otherwise)

Subsidy	Subsidy type	Targeted energy source	Stage	2013 estimate	2014 estimate	Estimated annual average amount
Coal mining and capital facilities	Direct spending	Coal	Extraction and production	6.5	6.5	6.5
Coal mining inherited social liabilities	Direct spending	Coal	Field decommissioning	68.1	65.4	66.7
Support for coal briquette production	Direct spending	Coal	Production	128.6	151.1	139.9
R&D – funding for resource technologies	Direct spending	Gas	Exploration	2.3	2.3	2.3
R&D – funding for 'renewable energy'	Direct spending	Coal	Plant planning and construction	1.2	1.2	1.2
Other national subsidies (in Data Sheet)				0.2	0.2	0.2
Total						
Total national subsidies ($ m)						217
Total national subsidies (KRW m)						235,467

Sources and additional data are available in the Data Sheets that accompany each Country Study.

It is worth noting that, running counter to this, Korea has also begun to establish some new taxes on certain types of fossil fuels. In January 2015, Korea announced a tax on coal imports that came into effect in July 2015, which will have implications for downstream production of coal-fired electricity. Consumption taxes were simultaneously reduced on a number of other fossil fuels, including LNG, fuel oil and propane (Cho, 2014). As of January 2015, Korea also launched one of the world's largest greenhouse gas cap-and-trade systems (Valentine, 2015).

State-owned enterprise investment

Korea's state-owned oil, gas and mining companies are actively involved in exploration and production activities, most of which take place overseas. Domestically, production is mostly limited to offshore natural gas, with exploration activities for offshore oil and gas ongoing.

KNOC owns assets both in Korea and internationally, notably in US shale oil plays, Canada's tar sands and Venezuela's heavy oil plays, as well as assets in the UK, Iraq, Kazakhstan and in several more countries. Of KNOC's 81 million barrels of oil equivalent (mboe) production in 2013 (KNOC, 2014), only about 4 mboe were domestic production (Rystad, 2015).

Capital expenditures of $2.1 billion in 2013 reflect significant government support to oil and gas production, and highlight KNOC's aggressive approach to new exploration and acquisition of additional production. Recent submissions by KNOC to legislators indicated that more than $285 million had been lost on 10 exploration projects between 2008 and 2012 (Yeon-Jin, 2014). Table 2 provides a summary of Korea's state-owned enterprise (SOE) investment, including KNOC's performance (KNOC, 2014).

Korea Gas Corporation (KOGAS) is the world's largest LNG-importing company and the sole importer of LNG into Korea. KOGAS operates three LNG terminals, operates all of Korea's natural gas pipelines, and also operates oil pipelines (Table 2).

The state-owned Korea Coal Corporation (KOCOAL) oversees Korea's domestic coal industry. KOCOAL operates domestic mines producing anthracite. Korea's domestic coal production has been in long-term decline. Domestic coal production was 0.8 million tonnes of oil equivalent (mtoe) in 2013, a significant decline compared to 1.2 mtoe in 2008 (KEEI, 2014), and well under 1% of Korea's demand for coal. KOCOAL is investing more in overseas mines as demand for bituminous coal grows, due primarily to increasing energy demand (EIA, 2014). It currently owns a 51% stake in a mine in Mongolia.

KOCOAL recorded a net loss of $72 million in 2013 and a net loss of $65 million in 2014 (ALIO, 2015). Capital expenditure is relatively low in absolute terms at under $30 million per year (ALIO, 2015). Table 2 includes data on KOCOAL's operations (KEEI, 2014; ALIO, 2015).

The state-owned generation, transmission, distribution and retailing company KEPCO almost entirely dominates Korea's electricity market. It is 51% owned by the state (directly and indirectly), with that share divided between the Korea Finance Corporation (30%) and the Government of Korea (21%).

In Korea, consumer prices for electricity remain well below those in other countries at similar levels of development, which contributes to increased demand for electricity, and has also helped drive power shortages in recent years (EIA, 2014). This artificially low pricing is

Table 2: Korea's state-owned enterprise (SOE) investment, 2013-2014 ($ million except where stated otherwise)

SOE	Project / investment	Description	Fossil fuel sector	Value 2013	Value 2014	Average annual value
KNOC	Investment	Capital expenditure (as acquisition of property, plant, and equipment)	Oil and gas	2,095	N/A	2,095
KEPCO	Investment	Capital expenditure for fossil fuel generating assets only	Coal and gas (electricity)	5,933	6,365	6,149
KOGAS	Investment	Acquisition of property, plant, and equipment (million USD)	Oil and gas	3,453	3,257	3,355
KOCOAL	Investment	Capital expenditure	Coal	28	24	26
Totals						
Total SOE investment ($ m)						11,625
Total SOE investment (KRW m)						12,613,125

Sources and additional data are available in the Data Sheets that accompany each Country Study.
Notes: N/A indicates data was not publicly available at the time of publication. When data is not available for both 2013 or 2014, the two-year average is based on the data for one year only.

likely to have links to production subsidies in Korea, given that the main power producer is state-owned.

Korea's electricity supply mix is dominated by fossil fuels. In 2013, electricity generation by source in Korea was 39% coal, 25% natural gas, 6% oil and 27% nuclear, with the remainder contributed by renewables and hydro (KEPCO, 2014). Due to changes in the way this information is reported in KEPCO's 2015 annual report, precise disaggregation by fuel source was not possible for 2014.

In addition to domestic operations, KEPCO also operates abroad, and has invested in a number of Australian coal mines. It has also built a number of coal-fired power plants internationally, and owns or operates coal- or natural gas-fired power plants in other G20 countries, including China, Saudi Arabia and Mexico. Recently, KEPCO won a bid to build and operate Viet Nam's largest coal-fired power plant, a 1,200-MW capacity plant in Nghi Son, financed in part by the Export-Import Bank of Korea (KEPCO, 2013). Details on KEPCO's performance are included in Table 2 (KEPCO, 2015, 2014).

Public finance

Domestic

Only one domestic public finance transaction was identified, from the Korean Finance Corporation to support the Boryeong LNG terminal in 2014, totalling $80 million.

International

Korea's international public finance for fossil fuel production averages $10.3 billion per year. Korea has four primary public finance institutions that support fossil fuel production: the Export-Import Bank of Korea (KEXIM), the Korea Trade Insurance Corporation (K-sure), the Korea Development Bank, and the Korea Finance Corporation. Because most of this information is collected from disparate sources, and not all data on transactions is publicly available, it is likely that these estimates are conservative.

The majority of Korea's public finance for fossil fuels was channelled through KEXIM, and averaged $7.5 billion per year. The bank, which is one of Korea's official export credit agencies, provided more than $10 billion to oil and gas production between 2013 and 2014. It was also Korea's largest provider of public finance for coal internationally, with $1.8 billion in support for coal-fired power plants over the same period. Korea's public finance institutions approved transactions in 2013 and 2014 that will support the development of more than 3.8 GW of new coal-fired electricity generating capacity.

Korea's second largest provider of public finance for fossils is the Korea Trade Insurance Corporation (K-sure), the country's other official export credit agency, which averaged $2 billion in finance for fossil fuels per year.

Smaller amounts of international support for fossil fuel production were provided by the Korea Finance Corporation and the Korea Development Bank, which provided an average of about $386 million to $367 million in support annually in 2013 and 2014, respectively.

Korea also holds shares in a number of multilateral development banks (MDBs), which also provide support to fossil fuel production. Korea's share of this support averages $83 million per year.

In official discussions to establish limits on OECD countries' export finance for coal, Korea has been widely cited as one of three countries that is 'trying to block progress', alongside Japan and Australia (Mathiesen, 2015). This position may be partly explained by Korea's role as a major financier of coal projects internationally: a recent analysis found that between 2007 and 2014, Korea provided nearly $7 billion in public finance for overseas coal (NRDC, WWF, and OCI, 2015).

Korea has not indicated that it plans to place any restrictions on the provision of public finance for fossil fuels internationally, despite the establishment of restrictions on international finance for coal projects by a number of other countries.

Private companies

Private upstream oil and gas companies

Korea's state-owned petroleum company, KNOC, dominates the Korean upstream oil and gas industry (see SOE Investment section above).

Private midstream/downstream oil and gas companies

Korea's state-owned natural gas company, KOGAS, controls Korea's downstream natural gas industry (see SOE Investment section above).

Refining in Korea is a major industry with four large private sector players: SK Energy, GS-Caltex, S-OIL and Hyundai Oilbank. Refining capacity in Korea has climbed from 840,000 barrels per day in 1990 to nearly 3 million barrels per day in 2013 (Kang and Bae, 2012; EIA, 2014).

Private coal companies

Korea's state-owned enterprise, KOCOAL, oversees coal mining and production in Korea (see SOE Investment section above).

Private electricity companies (fossil fuel-based)

Korea's state-owned enterprise, KEPCO, oversees electricity production from fossil fuels in Korea (see SOE Investment section above).

Table 3: Korea's public finance for fossil fuel production, 2013–2014 ($ million except where stated otherwise)

Institution name	Coal mining	Coal-fired power	Upstream oil and gas	Oil and gas pipelines, power plants and refineries	Total fossil fuel finance 2013 & 2014	Annual avg. fossil fuel finance
Domestic						
Korea Finance Corporation	-	-	-	80	-	-
Subtotal domestic	-	-	-	80	80	40
International						
Export-Import Bank of Korea	-	1,798	6,111	7,129	15,039	7,520
Korea Trade Insurance Corporation	-	495	1,411	2,193	4,099	2,049
Korea Finance Corporation	-	100	500	171	771	386
Korea Development Bank	-	-	425	308	733	367
Multilateral development bank share	-	47	23	96	165	83
Subtotal international	-	2,440	8,470	9,897	20,807	10,405
Totals						
Total public finance ($ m)						10,445
Total public finance (KRW m)						11,710,653

Sources and additional data are available in the Data Sheets that accompany each Country Study.
Note: When data is not available for both 2013 or 2014, the two-year average is based on the data for one year only.

Table 4: Top private companies operating in Korea's midstream and downstream oil and gas sectors

Companies	Refinery locations	Capacity (thousand barrels per day)
SK Innovation	Ulsan and Inchon	1,115
GS Caltex Corp.	Yeosu	775
S-Oil Corp.	Ulan	669
Hyundai Oil Refinery Co.	Daesan	390
Hyundai Lube Oil	Daesan	10

Source: EIA, 2014.

Methodology

(for detailed methodology see Chapter 3 of main report)

This report compiles publicly available information on G20 subsidies to oil, gas and coal production across G20 countries in 2013 and 2014. It provides a baseline to track progress on the phase-out of such subsidies as part of a wider global energy transition. It uses the following terms and their definitions.

Production subsidies

Government support for fossil fuel production. For the purpose of this country study, production subsidies include national subsidies, investment by state-owned enterprises (SOEs) (domestic and international) and public finance (domestic and international) specifically for fossil fuel production.

Fossil fuel production

Production in the oil, gas and coal sectors. This includes access, exploration and appraisal, development, extraction, preparation, transport, plant construction and operation, distribution and decommissioning. Although subsidies for the consumption of fossil fuels can support their production, this report excludes such subsidies as well as subsidies for the consumption of fossil fuel-based electricity.

National subsidies

Direct spending, tax and duty exemptions and other mechanisms (such as forms of capacity markets) provided by national and sub-national governments to support fossil fuel production. Normally, the value assigned for a national subsidy is the number provided by the government's own sources, by the OECD, or by an independent research institution.

State-owned enterprise (SOE) investment

A SOE is a legal entity created by a government to undertake commercial activities on its behalf. SOEs can be wholly or partially owned by governments.

It is difficult to identify the specific component of SOE investment that constitutes a subsidy, given the limited publicly available information on government transfers to SOEs (and vice-versa), and on the distribution of investment within their vertically integrated structures. Therefore, this report provides data on total investment by SOEs in fossil fuel production (where this information is available from the company), which are presented separately from national subsidies.

For the purpose of this report, 100% of the support provided to fossil fuel production through domestic and international investment by an SOE is considered when a government holds >50% of the shares.

Public finance

Public finance includes the provision of grants, equity, loans, guarantees and insurance by majority government-owned financial institutions for domestic and international fossil fuel production. Public finance is provided through institutions such as national and multilateral development banks, export credit agencies and domestic banks that are majority state-owned.

The transparency of investment data for public finance institutions varies. Assessing the portion of total financing that constitutes a subsidy requires detailed information on the financing terms, the portion of finance that is based directly on public resources (rather than raised on capital markets) or that depends on the institutions' government-linked credit rating. Few of the institutions assessed allow public access to this information. Therefore, we report the total value of public finance from majority government-owned financial institutions for fossil fuel production separately from 'national subsidy' estimates.

For the purpose of this report, 100% of the support provided to fossil fuel production through domestic and international financing is considered when a government holds >50% of the shares in the bank or financial institution.

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Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
Tel +44 (0)20 7922 0300
Fax +44 (0)20 7922 0399
www.odi.org
info@odi.org

Oil Change International
714 G Street SE Suite 202
Washington, DC 20003 USA
Tel: +1 202 518 9029
Fax: +1 202 330 5952
www.priceofoil.org
info@priceofoil.org

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