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

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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:
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>
<thead>
<tr>
<th>Subsidy</th>
<th>Subsidy type</th>
<th>Targeted energy source</th>
<th>Stage</th>
<th>2013 estimate</th>
<th>2014 estimate</th>
<th>Estimated annual average amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal mining and capital facilities</td>
<td>Direct spending</td>
<td>Coal</td>
<td>Extraction and production</td>
<td>6.5</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Coal mining inherited social liabilities</td>
<td>Direct spending</td>
<td>Coal</td>
<td>Field decommissioning</td>
<td>68.1</td>
<td>65.4</td>
<td>66.7</td>
</tr>
<tr>
<td>Support for coal briquette production</td>
<td>Direct spending</td>
<td>Coal</td>
<td>Production</td>
<td>128.6</td>
<td>151.1</td>
<td>139.9</td>
</tr>
<tr>
<td>R&amp;D – funding for resource technologies</td>
<td>Direct spending</td>
<td>Gas</td>
<td>Exploration</td>
<td>2.3</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>R&amp;D – funding for ‘renewable energy’</td>
<td>Direct spending</td>
<td>Coal</td>
<td>Plant planning and construction</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Other national subsidies (in Data Sheet)</td>
<td></td>
<td></td>
<td></td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>217</strong></td>
<td><strong>217</strong></td>
<td><strong>235,467</strong></td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th>SOE</th>
<th>Project / investment</th>
<th>Description</th>
<th>Fossil fuel sector</th>
<th>Value 2013</th>
<th>Value 2014</th>
<th>Average annual value</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNOC</td>
<td>Investment</td>
<td>Capital expenditure (as acquisition of property, plant, and equipment)</td>
<td>Oil and gas</td>
<td>2,095</td>
<td>N/A</td>
<td>2,095</td>
</tr>
<tr>
<td>KEPCO</td>
<td>Investment</td>
<td>Capital expenditure for fossil fuel generating assets only</td>
<td>Coal and gas (electricity)</td>
<td>5,933</td>
<td>6,365</td>
<td>6,149</td>
</tr>
<tr>
<td>KOGAS</td>
<td>Investment</td>
<td>Acquisition of property, plant, and equipment (million USD)</td>
<td>Oil and gas</td>
<td>3,453</td>
<td>3,257</td>
<td>3,355</td>
</tr>
<tr>
<td>KOCOAL</td>
<td>Investment</td>
<td>Capital expenditure</td>
<td>Coal</td>
<td>28</td>
<td>24</td>
<td>26</td>
</tr>
</tbody>
</table>

**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-
fi red 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 fi nancier of coal projects internationally: a
recent analysis found that between 2007 and 2014, Korea
provided nearly $7 billion in public fi nance 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)

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

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

<table>
<thead>
<tr>
<th>Companies</th>
<th>Refinery locations</th>
<th>Capacity (thousand barrels per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK Innovation</td>
<td>Ulsan and Inchon</td>
<td>1,115</td>
</tr>
<tr>
<td>GS Caltex Corp.</td>
<td>Yeosu</td>
<td>775</td>
</tr>
<tr>
<td>S-Oil Corp.</td>
<td>Ulan</td>
<td>669</td>
</tr>
<tr>
<td>Hyundai Oil Refinery Co.</td>
<td>Daesan</td>
<td>390</td>
</tr>
<tr>
<td>Hyundai Lube Oil</td>
<td>Daesan</td>
<td>10</td>
</tr>
</tbody>
</table>

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.
References


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