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**IEA/SLT/CERT(2011)8/REV1**



International Energy Agency  
Organisation for Economic Co-operation and Development

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**INTERNATIONAL ENERGY AGENCY  
STANDING GROUP ON LONG-TERM CO-OPERATION  
COMMITTEE ON ENERGY RESEARCH AND TECHNOLOGY**

**IEA/SLT/CERT(2011)8/REV1  
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**QUESTIONNAIRE FOR COUNTRY SUBMISSIONS FOR THE 2011/2012 SLT/CERT ANNUAL  
REVIEW OF ENERGY POLICIES**

*Please note that in this revision, a new RD&D Budget table (PART II Table 4) and its guideline (ANNEX II) were added as defined in CERT RD&D data workshop on 25 – 26 May.*

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**English text only**

STANDING GROUP ON LONG-TERM CO-OPERATION

COMMITTEE ON ENERGY RESEARCH AND TECHNOLOGY

**QUESTIONNAIRE FOR COUNTRY SUBMISSIONS FOR THE 2011/2012 SLT/CERT  
ANNUAL REVIEW OF ENERGY POLICIES**

(Note by the Secretariat)

**Structure**

1. Attached is the 2011/2012 questionnaire, which consists of two parts:

Part I: A set of descriptive questions on In-depth reviews (IDRs)

Part II: A set of questions on energy statistics

Each part addresses the different Member countries; Part I is for the reviewed countries during the upcoming review cycle, and Part II is for all countries.

The reviewed countries in the 2011/2012 review cycle are:

Ireland<sup>1</sup>, Switzerland, Finland, Germany and Sweden

**Purpose**

2. Country submissions will be used to prepare for individual country reviews and other studies in the IEA. It is particularly important to follow up Member-country implementation of recommendations from previous In-depth Reviews.

**Deadlines**

3. **In-depth review** countries are requested to send their submissions on **Part I** to Mr. Shinji Fujino, the Head of Country Studies Division (shinji.fujino@iea.org) and the country desk officer (see list below) *at least two months before the team visit*.

4. All countries are requested to submit **Part II** to Ms. Karen Treanton (slt@iea.org) *by 28 November 2011*. Countries whose reviews are scheduled in 2011 are requested to submit **both Part I and Part II at least two months before the team visit**.

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<sup>1</sup> The review of Ireland was originally scheduled in 2010/2011 cycle.

## Contacts

- On all questions related to the in-depth review, Member countries are encouraged to contact the relevant country desk officer:
  - Greece, Hungary, Norway, Spain, Sweden, Switzerland, Turkey, United Kingdom, European Union:  
Mr. Miika Tommila (+33 1 40 57 67 14, [Miika.Tommila@iea.org](mailto:Miika.Tommila@iea.org))
  - Australia, Austria, Canada, Denmark, Finland, Germany, Italy, Republic of Korea, New Zealand, Portugal, United States:  
Mr. Kieran McNamara (+33 1 40 57 67 88, [Kieran.McNamara@iea.org](mailto:Kieran.McNamara@iea.org))
  - Belgium, Czech Republic, France, Ireland, Japan, Luxembourg, Netherlands, Poland, Slovak Republic:

TBD

**PART I**

**OVERVIEW AND DESCRIPTION OF RECENT DEVELOPMENTS IN ENERGY POLICY  
(IN-DEPTH REVIEWS)**

Tips for responding to Part I of this questionnaire

- First, please examine all questions thoroughly and contact the relevant country desk officer if you have any questions.
- Please use existing information in English as much as possible, for example;
  - Published reports on policies and strategies
  - Official speeches and announcements
  - Industry submissions
  - Internal reports
  - Information on web-sites, etc.
  - Submissions to the IEA
    - Other questionnaires
    - Periodic reporting
  - Submissions to other international organisations

*Examples of possible sources of additional information*

	Reviewed Countries' Information	Submissions to IEA
General Policy	<ul style="list-style-type: none"> <li>• National Energy Strategy</li> </ul>	
Climate Change	<ul style="list-style-type: none"> <li>• Country submission to the United Nations Framework Convention on Climate Change (UNFCCC)</li> </ul>	
Energy Efficiency	<ul style="list-style-type: none"> <li>• Energy Efficiency Action Plan -EU-</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Efficiency Working Party report (2/year)</li> <li>• 25 Energy Efficiency recommendations progress reporting questionnaire (biennial)</li> <li>• Energy Efficiency Governance report</li> </ul>
Renewables	<ul style="list-style-type: none"> <li>• Renewable Energy Action Plan -EU-</li> </ul>	
Natural Gas	<ul style="list-style-type: none"> <li>• Transmission System Operator (TSO)'s /Distribution System Operator (DSO)'s annual report</li> <li>• Market operator's annual report</li> <li>• Regulator's annual report</li> <li>• Annual reporting to European Regulators' Group for Electricity and Gas (ERGEG) -EU-</li> </ul>	<ul style="list-style-type: none"> <li>• Gas Map annual Natural Gas Information</li> <li>• The Standing Group on Emergency Questions (SEQ) Fuel switching questionnaire (2011/12)</li> </ul>
Oil		
Coal		
CCS		<ul style="list-style-type: none"> <li>• <a href="#">IEA CCS Legal and Regulatory Review</a></li> </ul>
Electricity	<ul style="list-style-type: none"> <li>• TSO's / DSO's annual report</li> <li>• Market operator's annual report</li> <li>• Regulator's annual report</li> <li>• Annual reporting to ERGEG -EU-</li> <li>• Ten Years Network Development Plan to The European Network of Transmission System Operators for Electricity (ENTSO-E) -EU-</li> </ul>	<ul style="list-style-type: none"> <li>• SEQ Fuel switching questionnaire (2011/12)</li> </ul>
Nuclear	<ul style="list-style-type: none"> <li>• Regulator's annual report</li> </ul>	
RD&D		

1. If you are referring to an attachment or other external source, please indicate clearly where to find the information.

For example

<b>[Question]</b>	
4-C Renewables targets and progress:	Please describe any domestic or international targets for renewables in Total primary energy supply (TPES) and/or electricity generation, and provide information on progress towards meeting these targets
<b>[Response]</b>	
4-C Renewables targets and progress:	See Page 10 to 14 of <i>National Renewable Energy Action Plan (June 2010)</i>

2. Please make additional descriptions or revisions where necessary to submit the most recent information.
3. Please use the headings and numbering of this questionnaire in your submission.
4. Clearly state the objectives (including those for specific sectors) of energy policies, policy measures, including regulations and their status (planned or passed into law), programmes, public sector funding, organisations, institutional structures and sectoral objectives, in addition to major developments in industry structure.
5. Please also include information on policy implementation dates in order to have a clear chronology of policy developments in each section.
6. **Countries that have chosen a thematic review are encouraged to present more detailed information on those sectors/issues.**
7. Euro zone countries should report prices in Euros.
8. Please indicate contact information by chapter, or by question if necessary
  - contact name(s), title(s) and email address (es) by chapters (or questions)
9. Please send your response, including any attachments in English, in electronic form.
10. If necessary, the desk officer will ask you for more details or clarifications of the information.

**1. General Energy Policy** *Please provide the national energy strategy/policy document, including those under consideration, or relevant policy documents outlining key energy and environmental policies.*

	<b>Topic</b>	<b>Notes</b>
1-A	<b>Outline of key energy policies including major changes since previous IDR</b>	<p><b>Please describe the outline of key energy and relevant environmental policies.</b></p> <ul style="list-style-type: none"> <li>• Include major changes since previous IDR</li> <li>• Specifically describe the progress since previous IDR toward low-carbon energy sector: low-carbon energy supply and efficient use of energy</li> <li>• Specifically outline policies on Security of Supply</li> </ul>
1-B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken, or planned, in response to each general energy policy recommendation from the previous IDR</b>
1-C	<b>Notable Changes in Indicators</b>	<b>Please describe any notable changes to the energy and relevant environmental indicators over the last few years and projections through 2030</b>
1-D	<b>Institutional overview</b>	<p><b>Please provide a bulleted list of the major institutions working on energy and relevant environmental policy in the country.</b></p> <ul style="list-style-type: none"> <li>• Include a brief description of each; its functions, responsibilities and relationship with other organisations.</li> <li>• Describe how responsibilities are split between central and regional governments, if necessary</li> </ul>
1-E	<b>Taxation policy</b>	<p><b>Please describe energy taxation policy</b></p> <ul style="list-style-type: none"> <li>• Describe any environmental tax policies.</li> <li>• Describe how taxation of energy-related products has changed since the last IDR (if applicable).</li> <li>• Provide a table showing tax rates for each product (by sector, if applicable).</li> <li>• Provide relative tax rates between substitute fuels.</li> </ul>
1-F	<b>Fuel mix</b>	<p><b>Please comment on any major changes to shares of particular fuels in the country's energy fuel mix (TPES)</b></p> <ul style="list-style-type: none"> <li>• Describe on any efforts to raise or lower reliance on any particular fuels, as well as overall reliance on fuel imports or domestic production</li> </ul>

## 2. Climate Change

**Please provide climate change strategy/policy documents, including those under consideration, and, if still current, your country's submission to the UNFCCC outlining policies and measures on climate change**

	Topic	Notes
2-A	<b>Policies and measures overview including major changes since previous IDR</b>	<p><b>Please provide a table of climate change policies by sector, including the status of the policy (e.g. already implemented) and the expected emissions reductions</b></p> <ul style="list-style-type: none"> <li>• Comment briefly on major changes since the previous IDR</li> <li>• Include the costs of each measure (if known)</li> <li>• Describe measures in non-emission trading sectors</li> </ul>
2-B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken or planned in response to each climate change policy recommendation from the previous IDR</b>
2-C	<b>Greenhouse gas (GHG) and CO<sub>2</sub> targets and progress</b>	<p><b>Please provide information on GHG reduction targets information and progress towards meeting the targets</b></p> <ul style="list-style-type: none"> <li>• Include Kyoto, EU-burden sharing, or other domestic targets</li> <li>• Include total progress so far (% reduction)</li> <li>• Indicate that the target will be met domestically, or with international purchases, etc.</li> <li>• Comment on additional policies and measures which will be needed to meet targets.</li> </ul>
2-D	<b>Division of responsibilities</b>	<p><b>Please describe the division of climate change labour among government ministries and agencies, etc.</b> (if appropriate)</p> <ul style="list-style-type: none"> <li>• Describe how responsibilities are split between central and regional governments,</li> <li>• Describe briefly on notable regional emission trading systems or other initiatives</li> </ul>
2-E	<b>Emissions trading and national allocation plans</b>  <i>(if applicable)</i>	<p><b>Please provide information on the national emissions trading scheme</b></p> <ul style="list-style-type: none"> <li>• For countries participating in the EU-ETS <ul style="list-style-type: none"> <li>○ Provide information on the most recent national allocation plan (NAP).</li> <li>○ Provide allocation formulae by sector and credits reserved for new entrants.</li> <li>○ Provide a table showing allocation by sector, including credits reserved for new entrants, difference in allocation between NAP I and NAP II, and the estimated emissions without the cap, and most recent observed emissions for these sectors</li> <li>○ 2013-2020 strategy ETS cap</li> </ul> </li> </ul>
2-F	<b>International flexibility mechanisms</b>	<b>Please provide information on the reliance on international flexibility mechanisms including the foreseen quantities and cost, if available</b>

## 3. Energy Efficiency

Please provide Energy Efficiency Action Plan (EU) or energy efficiency strategy/policy documents, including those under consideration Your government has already submitted the followings to the Secretariat;

- Energy Efficiency Working Party (EEWP) country reports since last IDR
- Responses to 25 Energy Efficiency Recommendations progress reporting questionnaire (Spring 2011)

Please use these documents when answering the questions below.

	Topic	Notes
3 -A	<b>Policies and measures overview including major changes since previous IDR</b>	<p><b>Please provide details of energy efficiency policies by sector, including the status of each policy (e.g. already implemented)</b></p> <ul style="list-style-type: none"> <li>• Break up the table or list by sector               <ul style="list-style-type: none"> <li>○ Building</li> <li>○ Appliances, Equipment, Lighting</li> <li>○ Industry</li> <li>○ Transport</li> <li>○ Cross-sectoral</li> </ul> </li> <li>• Comment briefly on major changes since the previous IDR</li> <li>• Include the costs of each measure and the expected energy savings</li> </ul> <p>(For EU countries)</p> <ul style="list-style-type: none"> <li>• Note whether these policies fall under particular EU directives/Europe-wide policies</li> </ul>
	(1) Building Sector	<ul style="list-style-type: none"> <li>• Describe the policy efforts on building envelope (new and refurbishment), water and space heating equipment, cooling, lighting, including building codes if applicable.</li> </ul>
	(2) Appliances, Equipment, Lighting	
	(3) Industry	
	(4) Transport	<ul style="list-style-type: none"> <li>• Describe the policy efforts on fuel economy standards, voluntary agreements, vehicle tax and/or rebate systems, eco-driving programs, etc.</li> <li>• Describe programmes or incentives to reduce the growth rate in vehicle travel or for transport demand more generally.</li> <li>• Describe policies to encourage shifts to alternative fuels such as electric vehicles, etc.</li> </ul>
	(5) Cross-sectoral	
3 -B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken or planned in response to each energy efficiency policy recommendation from the previous IDR</b>
3 -C	<b>Energy efficiency, productivity, or intensity targets and progress</b>	<p><b>Please describe any domestic or international targets and provide information on progress towards meeting any applicable targets</b></p> <ul style="list-style-type: none"> <li>• Include total progress so far (% reduction)</li> <li>• Comment on additional policies and measures which will be needed to meet targets</li> </ul> <p>(Revise <a href="#">ANNEX 3 of Energy Efficiency Governance OECD/IEA, 2010</a>, if necessary.)</p>
3-D	<b>Division of responsibilities</b>	<p><b>Please describe the division of energy efficiency labour among government ministries, offices, etc</b></p> <ul style="list-style-type: none"> <li>• Describe how responsibilities are split between central and regional governments, if appropriate</li> </ul>

## 4. Renewables

**Please provide the national renewable energy strategy, Renewable Energy Action Plan (EU) or relevant policy documents**

	Topic	Notes
4-A	<b>Policies and measures overview including major changes since previous IDR</b>	<p><b>Please provide details of policies and measures by renewable technologies, including the status of the policy (e.g. already implemented)</b></p> <ul style="list-style-type: none"> <li>• Break up the table or list by renewable technologies <ul style="list-style-type: none"> <li>◦ e.g. Electricity (wind, solar, biomass...), Heat, Biofuels</li> </ul> </li> <li>• Comment briefly on major changes since the previous IDR</li> <li>• Include the costs of each measure and expected result of renewable-energy promotion</li> </ul>
4-B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken or planned in response to each renewables policy recommendation from the previous IDR</b>
4-C	<b>Renewables targets and progress</b>	<p><b>Please describe any domestic or international targets for renewables in Total primary energy supply (TPES) and/or electricity generation, and provide information on progress towards meeting these targets</b></p> <ul style="list-style-type: none"> <li>• Include total progress so far (% reduction)</li> <li>• Comment on additional policies and measures which will be needed to meet targets</li> </ul>
4-D	<b>Division of responsibilities</b>	<p><b>Please describe the division of renewables labour among government ministries, offices, etc</b></p> <ul style="list-style-type: none"> <li>• Describe how responsibilities are split between central and regional governments, if appropriate</li> </ul>
4-E	<b>Details on renewables promotion policy – electricity</b>	<p><b>Please provide additional details to 4-A on electricity, especially regarding support schemes such as feed-in-tariffs, renewable obligations or other measures (e.g. subsidies) to promote renewable electricity generation</b></p> <ul style="list-style-type: none"> <li>• Include tariff rates by technology, obligation amounts, fines for non-compliance/fulfilment etc.</li> <li>• Provide estimates of total annual cost of renewable electricity incentives</li> <li>• Provide details of administrative and planning procedures (and how they have worked in practice) including grid access/ connections</li> </ul>
4-F	<b>Details on renewables promotion policy – heat</b>	<p><b>Please provide additional details to 4-A on renewable heat production</b></p> <ul style="list-style-type: none"> <li>• Include the level of subsidies, obligation amounts, etc.</li> <li>• Provide estimates of total annual cost of renewable heat incentives.</li> </ul>
4-G	<b>Details on renewables promotion policy - transport/biofuels</b>	<p><b>Please provide additional details to 4-A on biofuels in transport sector</b></p> <ul style="list-style-type: none"> <li>• Include the level of subsidies and a table detailing fuel mixing requirements for bioethanol and biodiesel</li> <li>• Provide estimates of total annual cost of renewable transport incentives.</li> </ul>

## 5. Natural Gas

**Please provide the most recent annual report or policy documents on natural gas sector (e.g. Reports by sector regulator, TSO and DSO)**

	Topic	Notes
5-A	<b>Policies overview including major changes since previous IDR</b>	<b>Please describe briefly overview on natural gas policy</b> <ul style="list-style-type: none"> <li>• Comment briefly on major changes since the previous IDR</li> </ul>
5-B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken or planned in response to each natural gas policy recommendation from the previous IDR</b>
5-C	<b>Demand</b>	<b>Please describe notable changes to recent and projected gas demand</b> <ul style="list-style-type: none"> <li>• Comment on causes of changes, including number of customers, gas fired plants planned or under construction as well as recent trends and forecast changes</li> <li>• comment on gasification of residential and power sector</li> </ul>
5-D	<b>Peak demand and seasonality</b>	<b>Please provide data and brief comments on peak daily and monthly natural gas demand and summer/winter seasonality</b>
5-E	<b>Demand side policies</b>	<b>Please comment on the degree of interruptible gas customers, fuel switching, and other demand-side measures</b>
5-F	<b>Imports and Exports</b>	<b>Please describe notable changes to current and projected gas imports and exports</b> <ul style="list-style-type: none"> <li>• Include information on source of imports (country, pipeline, LNG) and indigenous production</li> <li>• Describe how gas is supplied at peak time on an average winter day (production, imports, storage, line pack).</li> </ul>
5-G	<b>Production &amp; Reserves</b> <i>(If applicable)</i>	<b>Please comment on notable changes to natural gas production and reserves including separate description of unconventional gas resources</b> <ul style="list-style-type: none"> <li>• Describe, if any, government incentives to promote exploration &amp; production</li> </ul>
5-H	<b>Long-term contracting</b>	<b>Please comment on the level of long-term contracting in the gas market</b> <ul style="list-style-type: none"> <li>• Include a percentage of projected demand covered by contract</li> <li>• Comment on any regulation reserving part of the import capacity for short-term contracts</li> </ul>
5-I	<b>Transit</b>	<b>Please comment on the role of the country as a gas trading hub or transit country</b> <ul style="list-style-type: none"> <li>• Provide information on the volume of natural gas traded and the percentage of total trade compared to domestic consumption at different times of the year (max and min)</li> </ul>
5-J	<b>Industry structure</b>	<b>Please describe overview of the natural gas industry structure</b> <ul style="list-style-type: none"> <li>• Provide information on major players in each sector (production, transmission, wholesale, retail), including any public ownership <ul style="list-style-type: none"> <li>◦ Specify owners and operators of the pipeline grid and storage</li> <li>◦ Note transmission company's independence/relationship from/with other natural gas companies</li> </ul> </li> <li>• Provide market shares in production and retail sales by company</li> </ul>
5-K	<b>Map</b> <i>(If necessary, please update a map in Gas Information Book/IEA)</i>	<b>Please provide electronic maps (high-quality PDF, JPEG, or other image file) of the transmission system network</b> <ul style="list-style-type: none"> <li>• Include major transmission pipelines, LNG terminals and storage facilities</li> <li>• Include compressor stations, production facilities, natural gas reserves and resources</li> </ul>
5-L	<b>Pipeline Infrastructure and access</b>	<b>Please briefly describe the natural gas pipeline network and any major upgrades planned or in progress</b> <ul style="list-style-type: none"> <li>• Provide a table of major new investments by pipeline both for interconnection and major transmission/transit lines</li> <li>• Describe procedures for building new pipelines and mention whether new pipes will be given third party access or not</li> <li>• Include details of terms of access and tariffs to transmission networks, and connection provisions</li> <li>• Provide information on cross-border interconnection capacity and flows</li> </ul>

5. Natural Gas		<i>Please provide the most recent annual report or policy documents on natural gas sector (e.g. Reports by sector regulator, TSO and DSO)</i>
	Topic	Notes
5-M	Storage Infrastructure and access	<p><b>Please briefly describe any existing or planned storage facilities</b></p> <ul style="list-style-type: none"> <li>• Provide a table of existing and planned storage sites including information on capacity, withdrawal rates and project sponsors</li> <li>• Include details of terms of access and tariffs to storage facilities</li> <li>• Describe procedures for consenting new storage facilities</li> </ul>
5-N	LNG Infrastructure - and access	<p><b>Please briefly describe any existing and planned LNG terminals</b></p> <ul style="list-style-type: none"> <li>• Provide a table of existing and planned LNG terminals with information on holders and off-take capacity</li> <li>• Include details of terms of access and tariffs to LNG terminal</li> <li>• Describe consenting procedures for building new LNG infrastructure and mention whether new facilities will be given third party access or not</li> </ul>
5-O	Market overview	<p><b>Please provide a brief overview of gas market design and reform efforts in wholesale and retail market</b></p> <ul style="list-style-type: none"> <li>• Describe the current state (and future efforts) of gas market reform</li> <li>• Provide information on numbers of active participants and sales volumes in wholesale markets (physical and/or financial),</li> <li>• Provide details of active participants and sales volumes in the retail market including customer switching rates (churn)</li> </ul>
5-P	Regulatory Institutions	<p><b>Please describe the regulatory and oversight institutions of gas industry</b></p> <ul style="list-style-type: none"> <li>• Include functions of market regulation including upstream</li> <li>• Describe independence from other government institutions (e.g. ministry)</li> <li>• Describe how responsibilities are split between central and regional governments, if necessary</li> </ul>
5-Q	Pricing Policy	<p><b>Are there any retail-price controls on natural gas sales, e.g. regulated tariffs, last resort tariffs or Public Service Obligations</b></p> <ul style="list-style-type: none"> <li>• Provide information on the applicable customers of regulated prices</li> <li>• Who is responsible for determining price levels and any plans to phase them out.</li> </ul>
5-R	Subsidies and incentives	<p><b>Please describe any production or consumption subsidies and incentives</b></p> <ul style="list-style-type: none"> <li>• Include level and amounts of subsidies</li> <li>• Describe plans to increase, decrease, or remove subsidies</li> </ul>
5-S	Natural gas security	<p><b>What policies are in place to ensure and enhance natural gas security</b> e.g. import source diversification (country and supply route), domestic production, emergency reserves/storage and maximum withdrawal rates, interruptible contracts, fuel switching, TSO obligations and emergency action plans</p>

6. Oil		<b>Please provide the most recent annual report or policy documents on oil sector</b>
	Topic	Notes
6-A	<b>Policies overview including major changes since previous IDR</b>	<b>Please provide a brief overview on oil policy</b> <ul style="list-style-type: none"> <li>• Comment briefly on major changes since the previous IDR</li> </ul>
6-B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken or planned in response to each oil policy recommendation from the previous IDR</b>
6-C	<b>Demand</b>	<b>Please describe notable changes to recent and projected oil demand</b> <ul style="list-style-type: none"> <li>• Comment on causes of changes for individual sectors; describe any policies or measures to increase or decrease the share of heating oil consumption in residential sector</li> </ul>
6-D	<b>Imports and exports</b>	<b>Please describe notable changes to recent, and projected, oil import and export volumes</b> <ul style="list-style-type: none"> <li>• Include information on source of imports and indigenous production</li> <li>• Include information on locations of imports and exports</li> </ul>
6-E	<b>Production &amp; Reserves</b> <i>(If applicable)</i>	<b>Please comment on any notable changes to oil production and reserves levels including separate description of unconventional oil</b> <ul style="list-style-type: none"> <li>• Describe government incentives to spur Exploration &amp; Production</li> </ul>
6-F	<b>Industry structure</b>	<b>Please provide a high-level description oil industry structure in your country (exploration and production, wholesale, refining, transportation, storage and retail), (including any public ownership)</b> <ul style="list-style-type: none"> <li>• Provide information on major players in each sector</li> <li>• Include information on any recent consolidation among players (Downstream, Refinery)</li> <li>• Include the current and future balances in the domestic product market</li> <li>• Comment on any quality-related issues such as fuel standards impacting the refining sector</li> <li>• Provide information on the number and ownership of retail service stations</li> </ul>
6-G	<b>Transport fuels</b>	<b>Please describe the relative share of diesel and petrol in the transport sector</b> <ul style="list-style-type: none"> <li>• Provide information on the share of new vehicle fleet that is diesel-fuelled</li> <li>• Existing fleet?</li> <li>• Describe any policies to increase the share of diesel-fuelled cars</li> </ul>
6-H	<b>Pricing Policy</b>	<b>Please describe any price control on oil or oil products (including regulated prices, any price floors or ceilings in the market)</b> <ul style="list-style-type: none"> <li>• Provide information on the affected customer categories</li> <li>•</li> </ul>
6-I	<b>Subsidies and incentives</b>	<b>Please describe any production or consumption subsidies and incentives</b> <ul style="list-style-type: none"> <li>• Include level and amounts of subsidies</li> <li>• Describe plans to increase, decrease, or remove subsidies</li> </ul>
6-J	<b>Oil security</b>	<b>What policies are in place to ensure and enhance oil security</b> e.g. import source diversification (country and supply route), domestic production, emergency reserves/storage and emergency action plans, mandatory industry stocks, government stock agency, <a href="#">demand restraint measures</a> , etc.

7. Coal		<i>Please provide the most recent annual report or policy documents on coal sector</i>
	Topic	Notes
7-A	<b>Policies overview including major changes since previous IDR</b>	<b>Please provide a brief overview of coal sector and policy</b> <ul style="list-style-type: none"> <li>• Comment briefly on major changes since the previous IDR</li> </ul>
7-B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken or planned in response to each coal policy recommendation from the previous IDR</b>
7-C	<b>Demand</b>	<b>Please describe notable changes to recent and projected coal demand</b> <ul style="list-style-type: none"> <li>• Describe any policies or measures to increase or decrease the share of coal consumption in electricity sector</li> </ul>
7-D	<b>Production &amp; Reserves</b> <i>(If applicable)</i>	<b>Please provide information on domestic coal reserves and notable changes to recent and future coal production with causes</b> <ul style="list-style-type: none"> <li>• Provide information on domestic coal reserves</li> <li>• Describe, if any, government incentives to promote exploration &amp; production, or other policy issues on production (i.e. access to land)</li> </ul>
7-E	<b>Imports and exports</b>	<b>Please describe notable changes to recent and projected coal imports and exports</b> <ul style="list-style-type: none"> <li>• Include information on source of imports and indigenous production</li> <li>• Include information on locations of imports and exports.</li> </ul>
7-F	<b>Industry structure</b>	<b>Please describe the structure of the coal industry in your country</b> <ul style="list-style-type: none"> <li>• Provide information on major players, including any public ownership</li> <li>• Describe both the hard coal and lignite market</li> </ul>
7-G	<b>Subsidies and incentives</b>	<b>Please describe any production (or consumption) subsidies and incentives</b> <ul style="list-style-type: none"> <li>• Include level and amounts of subsidies</li> <li>• Describe plans to increase, decrease, or remove subsidies</li> </ul>
7-H	<b>Coal Security</b>	<b>What policies are in place to ensure and enhance coal security</b> e.g. import source diversification (country and supply route), domestic production, infrastructure investment, etc
7-I	<b>Clean Coal Technology</b>	<b>Please provide information on any programmes and promotion policies on other clean coal technology (e.g.IGCC)</b> <ul style="list-style-type: none"> <li>• Provide information on average and best thermal efficiency of coal-fired power plants</li> </ul>

<b>8. Carbon Capture Storage (CCS)</b>		<b>Please provide the most recent annual report or policy documents on CCS</b>
	<b>Topic</b>	<b>Notes</b>
<b>8-A</b>	<b>Policy Overview</b>	<p><b>What policies are in place, or being developed, to promote CCS</b></p> <ul style="list-style-type: none"> <li>• Has CCS been incorporated your general energy scenarios?</li> <li>• Have specific CCS-related policies, incl. incentive and funding frameworks been enacted?</li> <li>• Please describe the current legal and regulatory framework for CCS?</li> </ul> <p><i>(If any additions or updates are necessary to the latest edition of the IEA's "CCS Legal and Regulatory Review")</i></p> <p><b>Please describe the current legal and regulatory framework of CCS</b>  <a href="#">IEA CCS Legal and Regulatory Review</a>  <i>(Ctrl + Click to follow the link)</i></p>
<b>8-B</b>	<b>CCS projects</b>	<p><b>Please provide information on planned or operational CO2 capture and storage projects</b></p> <ul style="list-style-type: none"> <li>• Pilot-scale or test projects</li> <li>• Large-scale (500kt – 1Mt CO2 pa) demonstration projects and funding for them</li> </ul>
<b>8-C</b>	<b>Storage Potential</b>	<p><b>Please provide information on CO2 storage potential</b></p> <ul style="list-style-type: none"> <li>• Has your country assessed its total CO2 storage potential?</li> <li>• Have specific CO2 storage sites been characterised or authorised?</li> </ul>
<b>8-D</b>	<b>Public Acceptance</b>	<p><b>Please describe the current state of public acceptance and engagement efforts</b></p>

9. Electricity		<i>Please provide the most recent annual report or policy documents on electricity sector (e.g. Reports by sector regulator, TSO and DSO)</i>
	Topic	Notes
9-A	<b>Policies overview including major changes since previous IDR</b>	<b>Please provide a brief overview of electricity policy</b> <ul style="list-style-type: none"> <li>• Comment briefly on major changes since the previous IDR</li> </ul>
9-B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken, or planned, in response to each electricity policy recommendation from the previous IDR</b>
9-C	<b>Demand</b>	<b>Please describe notable changes to recent and projected electricity demand</b>
9-D	<b>Peak demand and seasonality</b>	<b>Please provide data and brief comments on peak daily and monthly electricity demand and summer/winter seasonality</b> <ul style="list-style-type: none"> <li>• Include future projections of annual peak in 2020 and 2030 (Please refer the reliability assessment by TSO, if appropriate)</li> </ul>
9-E	<b>Demand side policies</b>	<b>Please describe any demand side policies and measures to curb peak demand or reduce consumption of electricity</b> <ul style="list-style-type: none"> <li>• Provide information on interruptible contract, real-time pricing, time-of-use pricing, or any other demand-side measures</li> </ul>
9-F	<b>Existing and New Capacity</b>	<b>If possible, please provide a table of existing and new electricity generation capacity (in MW or GW) by fuel type and ownership</b> <ul style="list-style-type: none"> <li>• Provide average capacity factors by fuel type</li> <li>• Describe characteristics by fuel type and ownership (Please refer the adequacy forecast by TSO, if appropriate)</li> </ul>
9-G	<b>Import and export</b>	<b>Please provide information on the electricity imports and exports</b> <ul style="list-style-type: none"> <li>• Provide data of electricity import or export by source or destination</li> <li>• If relevant, comment on future projections and any policies on changing import dependency</li> </ul>
9-H	<b>Industry structure</b>	<b>Please provide an overview the structure of the electricity industry in your country</b> <ul style="list-style-type: none"> <li>• Include information on major players (utilities, IPPs, municipalities, etc.) in each sector (generation, wholesale and retail), including any public ownership</li> <li>• Provide information on numbers of active market participants, including market shares and sales volume at wholesale level (physical and/or financial)</li> </ul>
9-I	<b>Map</b>	<b>Please provide an electronic map (ideally a high-quality PDF or JPEG, or other image file) of the electricity network</b> <ul style="list-style-type: none"> <li>• Include major high-voltage transmission lines, interconnection lines and location of major generation plants</li> </ul>
9-J	<b>Transmission infrastructure and access</b>	<b>Please briefly describe the electricity transmission network and any major upgrades or extensions planned or in progress</b> <ul style="list-style-type: none"> <li>• Include information on ownership and operation of transmission networks</li> <li>• Include details of terms of access and tariffs to transmission networks and connection provisions</li> <li>• Include information on transmission network losses and outages</li> </ul>
9-K	<b>Cross-border transmission lines</b>	<b>Please provide a table of existing and planned interconnection lines with neighbouring countries</b> <ul style="list-style-type: none"> <li>• Include operating capacity and voltage of each line</li> <li>• Add descriptions about procedure to allocate interconnection capacity among market participants (e.g. explicit auction or implicit auction)</li> <li>• Describe transmission congestion management methodology for domestic transmission networks and interconnections</li> </ul>
9-L	<b>Distribution infrastructure and access</b>	<b>Please provide a brief description of the distribution network(s)</b> <ul style="list-style-type: none"> <li>• Include information on ownership and operation of distribution network</li> <li>• Include details of terms of access and tariffs to distribution networks, and connection provisions</li> <li>• Include information distribution network losses and outages</li> </ul>

## 9. Electricity

**Please provide the most recent annual report or policy documents on electricity sector (e.g. Reports by sector regulator, TSO and DSO)**

	Topic	Notes
9-M	Market Overview	<p><b>Please provide a brief overview of electricity market design and reform efforts on wholesale and retail market</b></p> <ul style="list-style-type: none"> <li>Describe the current state and future efforts on electricity market reform</li> <li>Briefly describe the wholesale electricity market arrangement, including information on the market operator and a time series of wholesale prices</li> <li>Please provide details of market participants at retail market level and by market share and customer numbers</li> <li>Provide information on customer switching rate by sector and customer switching procedures at retail market</li> </ul>
9-N	Regulatory institutions	<p><b>Please describe the regulatory and oversight institutions of electricity industry</b></p> <ul style="list-style-type: none"> <li>Describe independence from other government institutions (e.g. ministry)</li> <li>Describe how responsibilities are split between central and regional governments, if necessary</li> </ul>
9-O	Distributed and variable renewable power integration	<p><b>Please describe the current, and future, level of integration of distributed and variable power generation (such as wind or solar power)</b></p> <ul style="list-style-type: none"> <li>Comment on impact of variable power integration</li> <li>Describe efforts and/or policies to promote variable renewable power integration</li> </ul>
9-P	Smart Grid	<p><b>Please describe any programmes or policies to promote implementation of smart grid technologies</b></p> <ul style="list-style-type: none"> <li>Provide information on current state and future plan of smart metering deployment (Please refer if related activities are described in 9-E, 9-J or 9-O.)</li> </ul>
9-Q	Pricing Policy	<p><b>Are there any retail price controls on electricity, including regulated tariff, last resort tariff or Public Service Obligations?</b></p> <ul style="list-style-type: none"> <li>Provide information on the application of regulated prices last resort tariff or Public Service Obligations</li> <li>Who is responsible for setting the price level and are there any plans to phase out?</li> </ul>
9-R	Electricity security - supply	<p><b>What policies are in place to ensure and enhance electricity security</b></p> <ul style="list-style-type: none"> <li>Including reserve margin assessment, import capacity (including new investment), grid reinforcements, market enhancements, generation diversification, efficiency improvement</li> </ul>
9-S	CHP development	<p><b>Please provide information on CHP developments including penetration levels</b></p> <ul style="list-style-type: none"> <li>Describe policies and measures to promote CHP development (e.g. feed-in tariff, grid interconnection requirements, subsidies, etc). Specify if these policies address the district heating sector.</li> </ul>

## 10. District Heating

**Please provide the most recent annual report or policy documents on district heating sector**

	Topic	Notes
10-AA	District Heating – Industry Structure –	<p><b>Please describe district heating industry structure</b></p> <ul style="list-style-type: none"> <li>Describe who owns and operates different parts of the DH systems, such as CHP plants, heat-only boilers and district heating networks. If the ownership/operation structure differs significantly among systems, describe key trends.</li> <li>Provide information on technology and fuel sources.</li> </ul>
10-AB	District Heating – Supply and Demand –	<p><b>Please provide information on District Heating supply and demand</b></p> <ul style="list-style-type: none"> <li>Include historical data and projections</li> <li>Provide data on the market shares of different heating options including district heating, individual gas heating, electric heating, etc.</li> <li>Specify if consumers have the ability to switch from district heating to other heat supply options.</li> </ul>
10-AC	District Heating – Regulation and Prices –	<p><b>Please describe regulation of district heating</b></p> <ul style="list-style-type: none"> <li>Provide overview of regulations of district heating</li> <li>Include information on regulatory institutions</li> <li>Describe any price regulation and subsidies</li> </ul>

11. Nuclear Energy		<i>(If applicable)</i>
	Topic	Notes
11-A	Policies overview including major changes since previous IDR	<p>Please provide a brief overview of nuclear policy</p> <ul style="list-style-type: none"> <li>• Comment briefly on major changes since the last IDR</li> </ul>
11-B	Previous IDR recommendations	Please describe actions taken or planned in response to nuclear energy policy recommendation from the previous IDR
11-C	Nuclear Industry Structure	<p>Please comment on ownership and operations in the nuclear sector, including nuclear-fuel fabrication, reprocessing, storage, waste management, etc.</p> <ul style="list-style-type: none"> <li>• Comment on the degree of implementation of the fuel cycle, including enrichment, nuclear-fuel fabrication and reprocessing</li> </ul>
11-D	Nuclear fuel sources	Please comment on the major sources of uranium or enriched uranium for nuclear fuel.
11-E	Waste management - low- and intermediate-level	<p>Please comment on Low and Intermediate Level Waste (LILW) management policy and operations</p> <ul style="list-style-type: none"> <li>• Include information where LILW is stored and efforts to establish a permanent repository, with a project timeline</li> </ul>
11-F	Waste management - high-level	<p>Please comment on high-level waste management policy and operations</p> <ul style="list-style-type: none"> <li>• Include information where high-level waste is stored and efforts to establish a permanent repository, with a project timeline</li> </ul>
11-G	Regulatory Institutions	Please comment on institutions responsible for safety and other regulation
11-H	Regulation	<p>Please describe the provisions regulating lifetime extension, refurbishment and safety upgrades of existing reactors</p> <p><i>-Post Fukushima-</i> Please describe any changes expected in nuclear regulations following the Fukushima accident (if known)</p>
11-I	Public Awareness	<p>Please provide information on measures already implemented and planned to inform general public of nuclear energy</p> <ul style="list-style-type: none"> <li>• Describe in the context of the energy policy objectives and challenges regarding nuclear energy.</li> </ul>

## 12. Energy Technology Research, Development and Innovation (ETRDI)

	Topic	Notes
12-A	<b>Policies overview including major changes since previous IDR</b>	<b>Please describe briefly overview on ETRDI policy</b> <ul style="list-style-type: none"> <li>• Comment briefly on major changes since the last IDR</li> <li>• Describe how coherent is the energy ETRDI strategy in relation to objectives of other energy policy areas such as energy security or climate change</li> </ul>
12-B	<b>Previous IDR recommendations</b>	<b>Please describe actions taken or planned to respond in response to each ETRDI energy policy recommendation from the previous IDR in turn</b>
12-C	<b>ETRDI priorities</b>	<b>Please provide a list of priority areas</b> <ul style="list-style-type: none"> <li>• Describe how priority areas have been/are shifting in relation to encouraging technology innovation, low/no carbon technology efforts, renewable energy, CCS, energy efficiency etc.</li> <li>• Describe how priorities have been identified (e.g. was it based on available resources, export potential, etc.)</li> </ul>
12-D	<b>Division of responsibilities and decision making process</b>	<b>Please describe the division of labour among government ministries, offices, universities, private R&amp;D entities, etc. on ETRDI policy and funding</b> <ul style="list-style-type: none"> <li>• Describe how responsibilities are split between central and regional governments, universities or private R&amp;D entities, providing an organisation chart (with the number of full-time personnel)</li> <li>• Provide a flow chart of the decision-making process for establishing priorities and setting policies between the institutions</li> </ul>
12-E	<b>Funding</b>	<b>Please describe notable changes to recent and projected ETRDI</b> <ul style="list-style-type: none"> <li>• Include causes or related policies or programs of them</li> </ul>
12-F	<b>Evaluation.</b>	<b>Please describe how you evaluate progress in ETRDI funding projects toward achieving their goals</b> <ul style="list-style-type: none"> <li>• Describe what systems are in place to monitor effectiveness of relevant funding or spending data? (e.g. ex-ante or other)</li> </ul>
12-G	<b>International collaborative efforts</b>	<b>Please comment on international ETRDI efforts and policies</b> <ul style="list-style-type: none"> <li>• Include (but not limited to), participation in IEA Implementing Agreements, EU, non-OECD member countries, technology platforms or research for a public-private partnerships etc.</li> </ul>
12-H	<b>Involvement of the Private sector</b>	<b>Please comment on efforts to spur private sector participation in public for ETRDI programmes</b> <ul style="list-style-type: none"> <li>• Provide information on estimates of private ETRDI spending, along with explanations of the methodology used to collect this data.</li> </ul>
12-I	<b>Noteworthy projects and research areas</b>	<b>Please provide information on noteworthy projects and research areas</b> <ul style="list-style-type: none"> <li>• Break down by subject area and add short descriptions by project</li> <li>• Give examples to highlight particularly interesting/unique projects that demonstrate your country's leadership in a particular technology area. (Provide photographs or other images)</li> </ul>

**PART II: ALL COUNTRIES**

**STATISTICAL INFORMATION**

Please complete the attached tables, using only the forms provided in this questionnaire. **If your administration will not be producing new energy projections for the 2011/2012 cycle, please send an email to [SLT@iea.org](mailto:SLT@iea.org) informing the IEA of the situation.** The Secretariat will use the previous submission as stored in its data base.

**Note: If your country is not an in-depth review country and you are not submitting new forecasts, then you do not need to send in the 2010 provisional data in tables 1, 2 and 3.**

**Note: Projections of 2035 and 2040 are optional.**

If your country has *already* produced projections of 2035 and/or 2040, please provide

*List of tables:*

Table 1: Energy Balances for 2010, 2020, 2030, 2035 (optional) and 2040 (optional).

Table 2: Supplementary Data

Table 3: Coal Production, Imports and Exports  
*note* ***For reviewed countries in 2011/2012 cycle, this table can be submitted to the Secretariat by the end of November***

Table 4: Information on Government Energy RD&D Budgets

**Table 1 - Energy Balances****2010 Provisional** (non-indepth review countries only need to submit this provisional year if they are submitting new forecasts)*Mtoe (Million tonnes of oil equivalent)*

		Coal	Peat	Oil	Natural Gas	Nuclear	Hydro	Wind	Geothermal	Solar, etc.	Biofuels & Waste	Electricity	Heat	Total
		A	B	C	D	E	F	G	H	I	J	K	L	M
Production	A													
Imports	B													
Exports	C													
International Marine Bunkers	D													
International Aviation Bunkers	E													
Stock Changes	F													
Total Primary Energy Supply	G													
Transformation Processes & Energy	H													
Industry Own Use	I													
Electricity, CHP & Heat Plants	J													
Other transformation processes	K													
Own Use and Losses	L													
Statistical Differences	M													
Total Final Consumption	N													
Industry	O													
Transport	P													
<i>of which: Road</i>	Q													
Other	R													
<i>of which: Residential</i>	S													
Non-Energy Use	T													
<i>of which: Petrochem Feedstocks</i>	U													
Elec. Gen. Exc. Pumped storage (TWh)	V													
Heat Generated (PJ)														

**Table 1 - Energy Balances**  
**2020**

*Mtoe (Million tonnes of oil equivalent)*

		Coal	Peat	Oil	Natural Gas	Nuclear	Hydro	Wind	Geothermal	Solar, etc.	Biofuels & Waste	Electricity	Heat	Total
		A	B	C	D	E	F	G	H	I	J	K	L	M
Production	A													
Imports	B													
Exports	C													
International Marine Bunkers	D													
International Aviation Bunkers	E													
Stock Changes	F													
<b>Total Primary Energy Supply</b>	<b>G</b>													
Transformation Processes & Energy	H													
Industry Own Use	I													
Electricity, CHP & Heat Plants	J													
Other transformation processes	K													
Own Use and Losses	L													
Statistical Differences	M													
<b>Total Final Consumption</b>	<b>M</b>													
Industry	N													
Transport	O													
<i>of which: Road</i>	P													
Other	Q													
<i>of which: Residential</i>	R													
Non-Energy Use	S													
<i>of which: Petrochem Feedstocks</i>	T													
Elec. Gen. Exc. Pumped storage (TWh)	U													
Heat Generated (PJ)	V													

**Table 1 - Energy Balances**  
**2030**

*Mtoe (Million tonnes of oil equivalent)*

		Coal	Peat	Oil	Natural Gas	Nuclear	Hydro	Wind	Geothermal	Solar, etc.	Biofuels & Waste	Electricity	Heat	Total
		A	B	C	D	E	F	G	H	I	J	K	L	M
Production	A													
Imports	B													
Exports	C													
International Marine Bunkers	D													
International Aviation Bunkers	E													
Stock Changes	F													
Total Primary Energy Supply	G													
Transformation Processes & Energy	H													
Industry Own Use	I													
Electricity, CHP & Heat Plants	J													
Other transformation processes	K													
Own Use and Losses	L													
Statistical Differences	M													
Total Final Consumption	N													
Industry	O													
Transport	P													
<i>of which: Road</i>	Q													
Other	R													
<i>of which: Residential</i>	S													
Non-Energy Use	T													
<i>of which: Petrochem Feedstocks</i>	U													
Elec. Gen. Exc. Pumped storage (TWh)	V													
Heat Generated (PJ)	V													

**Table 1 - Energy Balances  
2035 (optional)**

*Mtoe (Million tonnes of oil equivalent)*

		Coal	Peat	Oil	Natural Gas	Nuclear	Hydro	Wind	Geothermal	Solar, etc.	Biofuels & Waste	Electricity	Heat	Total
		A	B	C	D	E	F	G	H	I	J	K	L	M
Production	A													
Imports	B													
Exports	C													
International Marine Bunkers	D													
International Aviation Bunkers	E													
Stock Changes	F													
Total Primary Energy Supply	G													
Transformation Processes & Energy	H													
Industry Own Use Electricity, CHP & Heat Plants	I													
Other transformation processes	J													
Own Use and Losses	K													
Statistical Differences	L													
Total Final Consumption	M													
Industry	N													
Transport	O													
<i>of which: Road</i>	P													
Other	Q													
<i>of which: Residential</i>	R													
Non-Energy Use	S													
<i>of which: Petrochem Feedstocks</i>	T													
Elec. Gen. Exc. Pumped storage (TWh)	U													
Heat Generated (PJ)	V													

**Table 1 - Energy Balances**  
**2040 (optional)**

*Mtoe (Million tonnes of oil equivalent)*

		Coal	Peat	Oil	Natural Gas	Nuclear	Hydro	Wind	Geothermal	Solar, etc.	Biofuels & Waste	Electricity	Heat	Total
		A	B	C	D	E	F	G	H	I	J	K	L	M
Production	A													
Imports	B													
Exports	C													
International Marine Bunkers	D													
International Aviation Bunkers	E													
Stock Changes	F													
Total Primary Energy Supply	G													
Transformation Processes & Energy	H													
Industry Own Use	I													
Electricity, CHP & Heat Plants	J													
Other transformation processes	K													
Own Use and Losses	L													
Statistical Differences	M													
Total Final Consumption	N													
Industry	O													
Transport	P													
<i>of which: Road</i>	Q													
Other	R													
<i>of which: Residential</i>	S													
Non-Energy Use	T													
<i>of which: Petrochem Feedstocks</i>	U													
Elec. Gen. Exc. Pumped storage (TWh)	V													
Heat Generated (PJ)														

**Table 2**  
**Supplementary Data**

		2010P	2020	2030	2035 (optional)	2040 (optional)
		A	B	C	D	E
GDP Growth Rates (%) (1) (2)	A					
Population (Millions) (2)	B					

(1) The annual growth rates (which refer to GDP in constant 2005 prices) should be calculated in the following way:

For 2010P, report the GDP 2010P/GDP 2009 annual rate.

For 2020, report the GDP 2020/GDP 2010P average annual rate.

For 2030, report the GDP 2030/GDP 2020 average annual rate.

For 2035, report the GDP 2035/GDP 2030 average annual rate.

For 2040, report the GDP 2040/GDP 2035 average annual rate.

(2) Before publication, the Secretariat will update the provisional 2010GDP and population figures submitted with those published in OECD *National Accounts*.

**Table 3**  
**Coal: Production, Imports and Exports**  
**(Mtoe)**

3/1

		2010P	2020	2030	2035 (optional)	2040 (optional)
		A	B	C	D	E
<b>PRODUCTION (1)</b>	A					
Anthracite	B					
Coking Coal	C					
Other Bituminous Coal	D					
Sub-Bituminous Coal	E					
Lignite	F					

3/2

		2010P	2020	2030	2035 (optional)	2040 (optional)
		A	B	C	D	E
<b>IMPORTS (2)</b>	A					
Anthracite	B					
Coking Coal	C					
Other Bituminous Coal	D					
Sub-Bituminous Coal	E					
Lignite	F					
Coal Products	G					

3/3

		2010P	2020	2030	2035 (optional)	2040 (optional)
		A	B	C	D	E
<b>EXPORTS (3)</b>	A					
Anthracite	B					
Coking Coal	C					
Other Bituminous Coal	D					
Sub-Bituminous Coal	E					
Lignite	F					
Coal Products	G					

(1) Should correspond to indigenous production of coal (excluding peat) on the energy balances, Table 1 (cell AA).

(2) Should correspond to imports of coal (excluding peat) on the energy balances, Table 1 (cell BA).

(3) Should correspond to exports of coal (excluding peat) on the energy balances, Table 1 (cell CA).

Note: The definitions of product categories in this table are the same as those in the OECD Coal (Solid Fossil Fuels and Manufactured Gases) Questionnaire.

**Table 4**  
**Information on Government Energy RD&D Budgets (A)**  
 Millions, national currency

<b>Years requested: 2010, 2011 estimated and 2012 estimated</b>  One sheet to be filled out for RD&D (excluding state-owned enterprises) and one sheet for state-owned enterprises.  BUDGETARY STAGE (see instructions on reporting issues)  FISCAL YEAR STARTING	Year	
	R&D	Demonstration
<b>1 ENERGY EFFICIENCY (sum of rows 11 to 19)</b>		
<b>11 Industry</b>		
111 Industrial techniques and processes		
112 Industrial equipment and systems		
113 Other industry		
119 Unallocated industry		
<b>12 Residential and commercial buildings, appliances and equipment</b>		
121 Building design and envelope		
1211 Building envelope technologies		
1212 Building design		
1219 Unallocated building design and envelope		
122 Building operations and efficient building equipment		
1221 Building energy management systems (incl. smart meters) and efficient internet and communication technologies		
1222 Lighting technologies and control systems		
1223 Heating, cooling and ventilation technologies		
1224 Other building operations and efficient building equipment		
1229 Unallocated building operations and efficient building equipment		
123 Appliances and other residential/commercial		
1231 Appliances		
1232 Batteries for portable devices		
1233 Other residential/commercial		
1239 Unallocated appliances and other residential/commercial		
129 Unallocated residential and commercial buildings, appliances and equipment		
<b>13 Transport</b>		
131 On-road vehicles		
1311 Vehicle batteries/storage technologies		
1312 Advanced power electronics, motors and EV/HEV/FCV systems		
1313 Advanced combustion engines		
1314 Electric vehicle infrastructure (incl. smart chargers and grid communications)		
1315 Use of fuels for on-road vehicles (excl. hydrogen)		
1316 Materials for on-road vehicles		
1317 Other on-road transport		
1319 Unallocated on-road vehicles		
132 Off-road transport and transport systems		
133 Other transport		

Years requested: 2010, 2011 estimated and 2012 estimated  One sheet to be filled out for RD&D (excluding state-owned enterprises) and one sheet for state-owned enterprises.	Year	
	R&D	Demonstration
139 Unallocated transport		
<b>14 Other energy efficiency</b>		
141 Waste heat recovery and utilisation		
142 Communities		
143 Agriculture and forestry		
144 Heat pumps and chillers		
145 Other energy efficiency		
149 Unallocated other energy efficiency		
<b>19 Unallocated energy efficiency</b>		
<b>2 FOSSIL FUELS: OIL, GAS and COAL</b> (sum of rows 21 to 29)		
<b>21 Oil and gas</b>		
211 Enhanced oil and gas production		
212 Refining, transport and storage of oil and gas		
213 Non-conventional oil and gas production		
214 Oil and gas combustion		
215 Oil and gas conversion		
216 Other oil and gas		
219 Unallocated oil and gas		
<b>22 Coal</b>		
221 Coal production, preparation and transport		
222 Coal combustion (incl. IGCC)		
223 Coal conversion (excl. IGCC)		
224 Other coal		
229 Unallocated coal		
<b>23 CO<sub>2</sub> capture and storage</b>		
231 CO <sub>2</sub> capture/separation		
232 CO <sub>2</sub> transport		
233 CO <sub>2</sub> storage		
239 Unallocated CO <sub>2</sub> capture and storage		
<b>29 Unallocated fossil fuels</b>		

Years requested: 2010, 2011 estimated and 2012 estimated  One sheet to be filled out for RD&D (excluding state-owned enterprises) and one sheet for state-owned enterprises.	Year	
	R&D	Demonstration
<b>3 RENEWABLE ENERGY SOURCES</b> (sum of rows 31 to 39)		
<b>31 Solar energy</b>		
311 Solar heating and cooling		
312 Solar photovoltaics		
313 Solar thermal power and high-temp. applications		
319 Unallocated solar energy		
<b>32 Wind energy</b>		
321 Onshore wind technologies		
322 Offshore wind technologies (excl. low wind speed)		
323 Wind energy systems and other technologies		
329 Unallocated wind energy		
<b>33 Ocean energy</b>		
331 Tidal energy		
332 Wave energy		
333 Salinity gradient power		
334 Other ocean energy		
339 Unallocated ocean energy		
<b>34 Biofuels (incl. liquid biofuels, solid biofuels and biogases)</b>		
341 Production of liquid biofuels		
3411 Gasoline substitutes (incl. ethanol)		
3412 Diesel, kerosene and jet fuel substitutes		
3413 Algal biofuels		
3414 Other liquid fuel substitutes		
3419 Unallocated production of liquid biofuels		
342 Production of solid biofuels		
343 Production of biogases		
3431 Thermochemical		
3432 Biochemical (incl. anaerobic digestion)		
3433 Other biogases		
3439 Unallocated production of biogases		
344 Applications for heat and electricity		
345 Other biofuels		
349 Unallocated biofuels		
<b>35 Geothermal energy</b>		
351 Geothermal energy from hydrothermal resources		
352 Geothermal energy from hot dry rock (HDR) resources		
353 Advanced drilling and exploration		
354 Other geothermal energy (incl. low-temp. resources)		
359 Unallocated geothermal energy		
<b>36 Hydroelectricity</b>		
361 Large hydroelectricity (capacity of 10 MW and above)		
362 Small hydroelectricity (capacity less than 10 MW)		
369 Unallocated hydroelectricity		
<b>37 Other renewable energy sources</b>		

Years requested: 2010, 2011 estimated and 2012 estimated One sheet to be filled out for RD&D (excluding state-owned enterprises) and one sheet for state-owned enterprises.	Year	
	R&D	Demonstration
<b>39 Unallocated renewable energy sources</b>		

Years requested: 2010, 2011 estimated and 2012 estimated  One sheet to be filled out for RD&D (excluding state-owned enterprises) and one sheet for state-owned enterprises.	Year	
	R&D	Demonstration
<b>4 NUCLEAR FISSION and FUSION</b> (sum of rows 41 and 49)		
<b>41 Nuclear fission</b>		
411 Light water reactors (LWRs)		
412 Other converter reactors		
4121 Heavy water reactors (HWRs)		
4122 Other converter reactors		
4129 Unallocated other converter reactors		
413 Fuel cycle		
4131 Fissile material recycling / reprocessing		
4132 Nuclear waste management		
4133 Other fuel cycle		
4139 Unallocated fuel cycle		
414 Nuclear supporting technologies		
4141 Plant safety and integrity		
4142 Environmental protection		
4143 Decommissioning		
4144 Other nuclear supporting technologies		
4149 Unallocated nuclear supporting technologies		
415 Nuclear breeder		
416 Other nuclear fission		
419 Unallocated nuclear fission		
<b>42 Nuclear fusion</b>		
421 Magnetic confinement		
422 Inertial confinement		
423 Other nuclear fusion		
429 Unallocated nuclear fusion		
<b>49 Unallocated nuclear fission and fusion</b>		
<b>5 HYDROGEN and FUEL CELLS</b> (sum of rows 51 and 59)		
<b>51 Hydrogen</b>		
511 Hydrogen production		
512 Hydrogen storage		
513 Hydrogen transport and distribution		
514 Other infrastructure and systems		
515 Hydrogen end-uses (incl. combustion; excl. fuel cells and vehicles)		
519 Unallocated hydrogen		
<b>52 Fuel cells</b>		
521 Stationary applications		
522 Mobile applications		
523 Other applications		
529 Unallocated fuel cells		
<b>59 Unallocated hydrogen and fuel cells</b>		

Years requested: 2010, 2011 estimated and 2012 estimated One sheet to be filled out for RD&D (excluding state-owned enterprises) and one sheet for state-owned enterprises.	Year	
	R&D	Demonstration
<b>6 OTHER POWER and STORAGE TECHNOLOGIES</b> (sum of rows 61 to 69)		
<b>61 Electric power generation</b>		
611 Power generation technologies		
612 Power generation supporting technologies		
613 Other electric power generation		
619 Unallocated electric power generation		
<b>62 Electricity transmission and distribution</b>		
621 Transmission and distribution technologies		
6211 Cables and conductors (superconducting, conventional, composite core)		
6212 AC/DC conversion		
6213 Other transmission and distribution technologies		
6219 Unallocated transmission and distribution technologies		
622 Grid communication, control systems and integration		
6221 Load management (incl. renewable integration)		
6222 Control systems and monitoring		
6223 Standards, interoperability and grid cyber security		
6229 Unallocated grid communication, control systems and integration		
629 Unallocated electricity transmission and distribution		
<b>63 Energy storage (non-transport applications)</b>		
631 Electrical storage		
6311 Batteries and other electrochemical storage (excl. vehicles and general public portable devices)		
6312 Electromagnetic storage		
6313 Mechanical storage		
6314 Other storage (excl. fuel cells)		
6319 Unallocated electrical storage		
632 Thermal energy storage		
639 Unallocated energy storage		
<b>69 Unallocated other power and storage technologies</b>		
<b>7 OTHER CROSS-CUTTING TECHNOLOGIES or RESEARCH</b> (sum of rows 71 and 73)		
<b>71 Energy system analysis</b>		
<b>72 Basic energy research that cannot be allocated to a specific category</b>		
<b>73 Other</b>		
<b>TOTAL BUDGET</b> (sum of rows 1 to 7)		

Years requested: 2010, 2011 estimated and 2012 estimated  One sheet to be filled out for RD&D (excluding state-owned enterprises) and one sheet for state-owned enterprises.	Year	
	R&D	Demonstration
<b>MEMO ITEMS:</b>		
<b>01 Smart grids</b>		
Part of 1221 (optional) Building energy management systems (incl. smart meters) and efficient internet and communication technologies		
1314 (optional) Electric vehicle infrastructure		
621 Transmission and distribution technologies		
622 Grid communication, control systems and integration		
Part of 71 Energy system analysis that is part of the smart grid concept		
Smart grid figures not identified in previous categories		
<b>02 Electric vehicles</b>		
Part of 1311 (optional) Vehicle batteries/storage technologies		
Part of 1312 (optional) Advanced power electronics, motors, and EV/HEV/FCV systems		
1314 (optional) Electric vehicle infrastructure		
Electric vehicle figures not identified in previous categories		
<b>03 Energy storage</b>		
1232 (optional) Batteries for portable devices		
1311 (optional) Vehicle batteries/storage technologies		
512 Hydrogen storage		
63 Energy storage (non-transport applications)		
Energy storage figures not identified in previous categories		

## ANNEX I

### GUIDELINES FOR THE COMPLETION OF THE ENERGY BALANCES (TABLE 1)

#### INTRODUCTION

The 2010 energy balance submitted with the response to this questionnaire will be used as *provisional* data by the SLT throughout the review process until 2010 balances become available from the publication *Energy Balances of OECD Countries*. This publication is based on data provided in response to the Electricity and Heat Questionnaire, Coal (solid fossil fuels and manufactured gases) Questionnaire, the Oil Questionnaire, the Natural Gas Questionnaire and the Renewables and Waste Questionnaire. Data provided in the SLT balances for 2010 and the forecast years should, therefore, be compatible with that provided in the above questionnaires. **Completion of the SLT energy balances should not be delayed, however, pending finalisation of the above questionnaires.**

#### NOTE ON METHODOLOGICAL CHANGE

Following the InterEnerStat initiative to harmonize energy statistics and energy balances (see <http://www.interenerstat.org/> for more information) and after having consulted with the Energy Statistics Working Group (see [http://www.iea.org/work/workshopdetail.asp?WS\\_ID=489](http://www.iea.org/work/workshopdetail.asp?WS_ID=489)), the IEA has decided to include gas works gas with the other coal gases in the coal column and not in the natural gas column. In addition, “Combustible Renewables and Waste” will be renamed to be “Biofuels and Waste” – it will continue to include liquid biofuels, solid biofuels, biogases, industrial waste and municipal waste.

**EXPLANATORY NOTES****(a) Units and Conversion from Original Units**

The energy balances should be completed in millions of tonnes (metric tons) of oil equivalent (Mtoe). One Mtoe = 41.868 Petajoules ( $10^{13}$  kilocalories). In converting fuels to Mtoe for the purpose of the energy balances and other tables, respondents should use the factors outlined below and in detail on the three pages of country-specific net calorific values to ensure uniformity between countries.

**Oil**

Starting with the 2008/2009 SLT/CERT questionnaire, the Secretariat proposed to change the default net calorific values used to convert oil products. The values are now region-specific and are expressed in kJ/kg. This change was introduced to better align the SLT questionnaire with the other annual questionnaires and to harmonize the net calorific values used in Europe with those used by Eurostat.

	<b>Default NCVs</b>		
	<b>Europe</b>	<b>North America</b>	<b>Pacific</b>
	<b>kJ/kg</b>	<b>kJ/kg</b>	<b>kJ/kg</b>
Refinery gas	49 500	48 100	48 100
Ethane	49 500	49 400	49 400
LPG	46 000	47 300	47 700
Aviation gasoline	44 000	44 800	44 600
Motor gasoline	44 000	44 800	44 600
Jet gasoline	43 000	44 800	44 600
Jet kerosene	43 000	44 600	44 500
Other kerosene	43 000	43 800	42 900
Naphtha	44 000	45 000	43 200
Gas/Diesel oil	42 600	42 600	42 600
Fuel oil	40 000	40 200	42 600
Petroleum coke	32 000	32 000	33 800
White Spirit	43 600	43 000	43 000
Lubricants	42 000	42 000	42 900
Bitumen	39 000	40 000	38 800
Other oil products	40 000	40 000	40 000

Crude oil (including NGL, refinery feedstocks, additives and "other hydrocarbons") production, imports and direct use should be converted using the specific net calorific value of the crude oil(s), NGL, feedstocks, additives and "other hydrocarbons" for the country concerned. The

NCVs used should be the same as those reported on the *Annual Oil Questionnaire*. If you are unable to get a copy of what was submitted, then contact [slt@iea.org](mailto:slt@iea.org) and we will provide them to you.

### Coal

The net calorific values used for the various coals and coal products that make up production, trade and consumption should be the same as those given in the *OECD Coal (solid fossil fuels and manufactured gases) Questionnaire*. If you are unable to get a copy of what was submitted, then contact [slt@iea.org](mailto:slt@iea.org) and we will provide them to you. As data for gas derived from coal are usually provided in TJ, the problem of specific net calorific values does not arise.

**Note that the data for the coal gases in Mtoe should be derived from net heat values.** To calculate the net heat content of a gas from its gross heat content, multiply the gross heat content by the appropriate following factor.

Gas works gas	0.9
Coke oven gas	0.9
Blast furnace gas	1.0
Oxygen steel furnace gas	1.0

### Natural Gas

Gas data provided in joules should be converted as follows: TJ / 41 868 = Mtoe.

Data should be converted from 1000 m<sup>3</sup> to Terajoules using the country-specific factors given in the OECD Natural Gas Questionnaire. [The *average* net heat value of 1000 m<sup>3</sup> of gas = 0.034 Terajoules.]

To calculate the **net heat content** of natural gas from its **gross heat content**, multiply the gross heat content by 0.9.

### **Nuclear**

The primary energy value ascribed to nuclear electricity is calculated from the gross generation by assuming that only 33% of the primary energy content appears as electricity. The calculation to be carried out is the following:  $\text{Gross electricity generation in TWh} \times 0.086 / 0.33 = \text{primary energy equivalent in Mtoe}$ .

Heat sold by nuclear power plants should be shown as an output in the heat column (positive number in cell IL), with an identical input in the nuclear column (negative number in cell IE).

### **Hydro**

The primary energy value ascribed to hydro electricity is the energy content of the gross electricity generation from the *natural flow* of the water course: Gross generation from hydro-electric plants, excluding that from pumped storage plants:  $\text{Electricity generation in TWh} \times 0.086 = \text{primary energy equivalent in Mtoe}$ .

### **Wind**

The primary energy value ascribed to electricity produced from wind is taken to be the physical energy content of the gross generation:  $\text{Gross electricity generation in TWh} \times 0.086 = \text{primary energy equivalent in Mtoe}$ .

### **Geothermal**

**If information on geothermal heat inputs to electricity generation is not available**, then the primary energy value ascribed to geothermal electricity is calculated from the gross generation by assuming that only 10% of the primary energy content appears as electricity. The calculation to be carried out is the following:  $\text{Gross electricity generation in TWh} \times 0.086 / 0.10 = \text{primary energy equivalent in Mtoe}$ .

For heat production, the indigenous production of geothermal is the difference between the enthalpy of the fluid produced in the production borehole and that of the fluid eventually disposed of (re injection borehole). Heat sold by geothermal plants should be shown as an output in the heat column (positive number in cell IL), with the input in the geothermal column (negative number in cell IH).

### **Solar, Tide/Wave/Ocean Energy, etc.**

The primary energy value ascribed to electricity produced from solar photovoltaic, tide, wave, ocean and other non-thermal sources is taken to be the physical energy content of the gross generation:  $\text{Gross electricity generation in TWh} \times 0.086 = \text{primary energy equivalent in Mtoe}$ .

The primary energy equivalent for solar thermal energy is the heat available to the heat transfer medium, i.e. the incident solar energy less the optical, collectors and other eventual losses. It should be reported as indigenous production. The quantity of heat consumed should be entered in the relevant final sectors.

### **Biofuels and Waste**

Data that are provided in joules in the OECD Renewables and Waste Questionnaire should be converted as follows:  $TJ / 41\,868 = Mtoe$ .

Data for charcoal and liquid biofuels (both reported in 1000 tonnes) should be converted using an appropriate country-specific factor.

### **Electricity**

Electricity is converted as follows:  $\text{Gross generation TWh} \times 0.086 = Mtoe$ .

### **Heat**

Heat is converted as follows:  $TJ / 41\,868 = Mtoe$ .

## ABBREVIATIONS

Btu:	British thermal unit
GWh:	gigawatt hour = $10^9$ watt hours
kcal:	kilocalorie = $10^3$ calories
kg:	kilogramme = $10^3$ grammes
kJ:	kilojoule = $10^3$ joules
Mt:	million tonnes = $10^6$ tonnes
m <sup>3</sup> :	cubic metre
PJ:	petajoule = $10^{15}$ joules
t:	metric ton = tonne = $10^3$ kg
TWh:	terawatt hour = $10^{12}$ watt hours
TJ:	terajoule = $10^{12}$ joules
toe:	tonne of oil equivalent = $10^7$ kcal

GCV:	gross calorific value
HHV:	higher heating value = GCV
LHV:	lower heating value = NCV
NCV:	net calorific value

CHP:	combined heat and power
DSM:	demand side management
PPP:	purchasing power parity
PSE:	producer subsidy equivalent
R&D:	research and development
RD&D:	research, development and demonstration
TPES:	total primary energy supply

### General Conversion Factors for Energy

To:	TJ	Gcal	Mtoe	MBtu	GWh
From:	multiply by:				
<b>TJ</b>	1	238.8	$2.388 \times 10^{-5}$	947.8	0.2778
<b>Gcal</b>	$4.1868 \times 10^{-3}$	1	$10^{-7}$	3.968	$1.163 \times 10^{-3}$
<b>Mtoe</b>	$4.1868 \times 10^4$	$10^7$	1	$3.968 \times 10^7$	11 630
<b>MBtu</b>	$1.0551 \times 10^{-3}$	0.252	$2.52 \times 10^{-8}$	1	$2.931 \times 10^{-4}$
<b>GWh</b>	3.6	860	$8.6 \times 10^{-5}$	3 412	1

**Conversion Factors for Mass**

<i>To:</i>	<b>kg</b>	<b>t</b>	<b>lt</b>	<b>st</b>	<b>lb</b>
<i>From:</i>	multiply by:				
<b>kilogramme (kg)</b>	1	0.001	$9.84 \times 10^{-4}$	$1.102 \times 10^{-3}$	2.2046
<b>tonne (t)</b>	1 000	1	0.984	1.1023	2 204.6
<b>long ton (lt)</b>	1 016	1.016	1	1.120	2 240.0
<b>short ton (st)</b>	907.2	0.9072	0.893	1	2 000.0
<b>pound (lb)</b>	0.454	$4.54 \times 10^{-4}$	$4.46 \times 10^{-4}$	$5.0 \times 10^{-4}$	1

**Conversion Factors for Volume**

<i>To:</i>	<b>gal U.S.</b>	<b>gal U.K.</b>	<b>bbl</b>	<b>ft<sup>3</sup></b>	<b>l</b>	<b>m<sup>3</sup></b>
<i>From:</i>	multiply by:					
<b>U.S. gallon (gal)</b>	1	0.8327	0.02381	0.1337	3.785	0.0038
<b>U.K. gallon (gal)</b>	1.201	1	0.02859	0.1605	4.546	0.0045
<b>Barrel (bbl)</b>	42.0	34.97	1	5.615	159.0	0.159
<b>Cubic foot (ft<sup>3</sup>)</b>	7.48	6.229	0.1781	1	28.3	0.0283
<b>Litre (l)</b>	0.2642	0.220	0.0063	0.0353	1	0.001
<b>Cubic metre (m<sup>3</sup>)</b>	264.2	220.0	6.289	35.3147	1 000.0	1

**Decimal Prefixes**

$10^1$	deca (da)	$10^{-1}$	deci (d)
$10^2$	hecto (h)	$10^{-2}$	centi (c)
$10^3$	kilo (k)	$10^{-3}$	milli (m)
$10^6$	mega (M)	$10^{-6}$	micro ( $\mu$ )
$10^9$	giga (G)	$10^{-9}$	nano (n)
$10^{12}$	tera (T)	$10^{-12}$	pico (p)
$10^{15}$	peta (P)	$10^{-15}$	femto (f)
$10^{18}$	exa (E)	$10^{-18}$	atto (a)

(b) **Computerisation**

Please note: It is possible to make computerised submissions of the Energy Balance tables (Table 1), the Supplementary Data (Table 2), Coal Production Imports and Exports (Table 3), and Information on Government Energy RD&D Budgets (Table 4). Countries are encouraged to use this service (available in Excel) in order to facilitate and speed up work on the data. If you have any questions or problems using the files, please contact:

Energy Statistics Division (Tel: 33 1 40 57 66 76)

email: [slt@iea.org](mailto:slt@iea.org)

**TABLE 1**

I. COLUMNS

Column A: **Coal** includes: All coal and coal products both primary and derived, such as anthracite, coking coal, other bituminous coal, sub-bituminous coal, lignite, oil shale (primary product – however, note that the secondary product shale oil should be included under oil), patent fuel, coke oven coke (including semi-coke), gas coke, coal tar, brown coal briquettes as well as **coke oven gas, gas works gas, blast furnace gas** and **oxygen steel furnace gas**. Note: peat should not be included in this column.

*Note: gas works gas was previously included with natural gas.*

Column B: **Peat** includes peat burned for energy. Peat used for non-energy purposes should not be included.

Column C: **Oil** includes:

1. Crude oil, refinery feedstocks, natural gas liquids, and additives as well as non-crude hydrocarbons (tar sands, shale oils, etc.) and Orimulsion. **Imports and exports** of liquefied synthetic fuels should also be shown here.

2. Oil products including liquefied petroleum gas and refinery gas. Synthesised liquid hydrocarbons from other sources (coal liquefaction) are transferred into the "Oil" column from the appropriate cells. For example, liquefied coal would be shown as coal consumed (and therefore negative) in cell JA of Table 1 and as secondary oil production (and therefore positive) in cell JC.

Column D: **Natural gas** includes natural gas (excluding natural gas liquids) and **import and exports** of gasified synthetic fuels.

*Note: gas works gas is now included in coal.*

Column E: **Nuclear power**. Please see (a) Units and Conversion from Original Units.

Column F: **Hydroelectricity**. Please see (a) Units and Conversion from Original Units. **Note that only natural flow hydro generation should be included.** The electricity losses associated with

pumped storage electricity should be included in the quantities given in cell KK "electricity-own use and losses".

Column G: **Wind**. Please see (a) Units and Conversion from Original Units.

Column H: **Geothermal**. Please see (a) Units and Conversion from Original Units.

Column I: **Solar, etc.** Please see (a) Units and Conversion from Original Units.

Column J: **Biofuels and Waste**. Solid biofuels, liquid biofuels, biogases, industrial waste and municipal waste. This includes wood, vegetable waste, ethanol, animal materials/waste, sulphite lyes, the biomass fraction of biogasoline, biodiesel and other liquid biofuels, and waste produced by the industrial, residential, commercial and public service sectors.

Column K: **Electricity** shows trade and final consumption in electricity (which is counted at the same heat value as electricity in final consumption i.e., 1 TWh = 0.086 Mtoe).

Column L: **Heat** permits the reporting of (a) the generation and consumption of heat for sale and (b) heat extracted from ambient air and water by heat pumps. The generation of heat for sale is reported as a transformation sector activity and the corresponding inputs should be included in the row "Electricity, CHP & Heat Plants". Heat consumed at the point of production which is generated from fuels reported elsewhere in the balance, is not reported since this would be double-counting.

Column M: **TOTAL**: the total of columns (A) to (L). This column shows **TOTAL PRIMARY ENERGY SUPPLY** (excluding international marine bunkers) and **TOTAL FINAL CONSUMPTION**.

## II. ROWS

Row A: "**Production**" shows only production of primary energy, i.e. hard coal and lignite, oil shale, peat, biofuels and waste (see definition above), crude oil and NGL, natural gas, and electricity and heat from nuclear, hydro, tidal, wave, geothermal, wind and solar plants. Heat from heat pumps that is extracted from the ambient air is included in the heat column.

- (a) where synthetic liquid or gas hydrocarbons are produced directly as a result of "in place extraction" they should be regarded as primary fuels and included under production. For example, oil from tar sands and shale should be shown in the oil column C.
- (b) production of natural gas should exclude gas reinjected, vented or flared but should include gas subsequently used in the gas extraction and drying processes as well as for transportation of the gas by pipeline.

Row B/C: **"Imports" (+) and "Exports" (-)** show trade both in primary and secondary forms of energy. Note in particular that LPG traded should be placed in the "oil" column. Nuclear fuel trade is not shown in the balance. Trade in electricity is counted at the same heat value as in final consumption (1 TWh = 0.086 Mtoe). For countries trading across common borders, actual import and export figures should be given, **not a net trade balance**.

Row D: **"International Marine Bunkers"** includes those quantities of fuel delivered to ships of all flags that are engaged in international navigation. The international navigation may take place at sea, on inland lakes and waterways, and in coastal waters. The domestic/international split is determined on the basis of port of departure and port of arrival, and not by the flag or nationality of the ship. Consumption by ships engaged in domestic navigation is not covered here but should be included in row O of Table 1 under the transport sector.

Row E: **"International Aviation Bunkers"** includes deliveries of aviation fuels to aircraft for international aviation. Fuels used by airlines for their road vehicles are excluded. The domestic/international split should be determined on the basis of departure and landing locations and not by the nationality of the airline. Consumption by aircraft engaged in domestic aviation are not covered here but should be included in row O of Table 1 under the transport sector.

Row F: **"Stock Changes"** show additions to stocks as negative, and lowering of stock levels as positive. **In energy balance projections, stock changes are conventionally zero.** However, countries may report them if they wish.

Row G: **"Total Primary Energy Supply"** (TPES) is made up of production (row A), imports (row B, positive), exports (row C, negative), international marine bunkers (row D, negative), international aviation bunkers (row E, negative) and stock changes (row F either positive or negative).

Row H: **"Transformation Processes and Energy Industry Own Use"** shows the total of the energy transformation processes (rows I and J) and energy used by energy-producing plants and losses (row K).

Row I: **"Electricity, CHP and Heat Plants"** cells IA to IJ in this table should contain inputs of each fuel for the production of electricity and heat as negative entries. This row includes both main activity producer (formerly know as public)<sup>2</sup> and autoproducer<sup>3</sup> plants. However, for autoproducers all fuel inputs to electricity production are taken into account, while only the part of fuel inputs to heat *sold* is shown. Fuel inputs for the production of heat consumed within the

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<sup>2</sup> Main activity producers generate electricity and/or heat for sale to third parties, *as their primary activity*. They may be privately or publicly owned. Note that the sale need not take place through the public grid.

<sup>3</sup> Autoproducer undertakings generate electricity and/or heat, wholly or partly for their own use as an activity which *supports* their primary activity. They may be privately or publicly owned.

autoproducer's establishment are *not* included here but are included with figures for the final consumption of fuels in the appropriate consuming sector.

Outputs of electricity appear as a positive number in cell IK and the heat that is *sold* to outside users appears as a positive number in cell IL. Transformation losses are shown in the Total column, cell IM.

Note 1: Gross electricity produced should contain total electricity generation in Mtoe calculated on the basis of 1 TWh = 0.086 Mtoe. Gross generation from hydro plants should *not* include that generated by pumped storage. The energy absorbed for pumped storage should be accounted for under "own use and losses", row K (see above column F: Hydro electricity).

Note 2: If electricity is being used to produce heat in heat pumps or electric boilers, the electricity inputs should be subtracted from the electricity production in cell IK.

Row J: "**Other Transformation Processes**" includes conversion losses in gas manufacture, oil refineries, coke ovens and blast furnaces, liquefaction, and other non-specified transformation.

Row K: "**Own Use and Losses**" contains the primary and secondary energy consumed by transformation industries for heating, pumping, traction and lighting purposes. These are shown as negative numbers. Included here are, for example, coal mines' own use of energy, power plants' own consumption (which includes net electricity consumed for pumped storage), and energy used for oil and gas extraction. Also includes losses in gas distribution, electricity transmission and coal transport. **Fuels used for pipeline transport should be included in the transport sector.** Note that electricity generation losses appear in the electricity, CHP and heat plants.

Row L: "**Statistical Differences**". In principle, the figure for total requirements should equal the sum of deliveries to final consumption, use for transformation and consumption within the energy sector. However, in practice this is rarely the case and the difference is shown as *statistical difference*. This arises because the data for the individual components of supply are often derived from different data sources by the national administration. Furthermore, the inclusion of changes in some large consumers' stocks in the supply part of the balance introduces distortions which also contribute to the statistical difference.

Row M: "**Total Final Consumption**" (TFC)

TFC = industry + transport + other + non-energy use, and

TFC = TPES + transformation processes and energy industry own use + statistical differences.

Row N: "**Industry**" sector should cover all activity in mining, manufacturing and construction except for fuel production and transformation sectors. The industry's use of energy for own

transport should be included under the "transport" row. The use of coke oven and blast furnace gas by the iron and steel industry appears in the form of coal and coal product consumption and not as gas. Feedstocks to the chemical/petrochemical industry should *not* be included in this category. See non-energy use below.

Row O: The "**Transport**" sector includes all fuels for transport regardless of sector, except international marine bunkers and international aviation bunkers. **Fuels used for pipeline transport should be included here.**

Row Q: "**Other**" covers residential, commercial/public services, agriculture/forestry, fishing and military use.

Row S: "**Non-energy Use**" includes coal, oil and gas that cannot be used for energy purposes, such as bitumen, lubricants, waxes, white spirit and that part of petroleum coke which cannot be used for energy purposes. Non-energy use of peat and biomass should not be included here (indeed, they should not figure in these tables at all unless they are used for energy purposes). The use of **petrochemical feedstocks** in the chemical/petrochemical industry should be included here and *not* in industry.

Row U: "**Electricity generated excluding pumped storage**" shows total quantities of gross electricity generated in TWh by all electricity and CHP plants (see the notes on row I). Electricity generated from pumped storage should *not* be included.

Row V: "**Heat generated (PJ)**" shows quantities of heat produced for sale by CHP and heat plants. Heat produced in electric boilers should be reported in cell VK and heat produced in heat pumps should be reported in cell VL.

## TABLE 2

Row A: "**GDP growth rates**" shows average annual growth rates.

Row B: "**Population**" in millions.

The Secretariat will update 2010 GDP and population figures submitted with those issued by OECD in its publication, *National Accounts*.

## GEOGRAPHICAL NOTES

- Australia excludes the overseas territories;
- Denmark excludes Greenland and the Danish Faroes;
- France includes Monaco and excludes overseas departments;
- Italy includes San Marino and the Vatican;
- Japan includes the Island of Okinawa;
- The Netherlands excludes Surinam and the Netherlands Antilles;
- Norway includes the Svalbard archipelago (Spitsbergen);
- Portugal includes the Açores and Madeira Islands;
- Spain includes the Canary Islands and the Islas Baleares;
- Switzerland does not include Liechtenstein;
- United Kingdom includes the Channel Islands;
- United States includes Puerto Rico, Guam and the Virgin Islands and the Hawaiian Free Trade Zone.

## ANNEX II

### GUIDELINES FOR COMPLETING TABLE 4<sup>4</sup>

The following instructions have been extracted from the *IEA Guide to Reporting RD&D Budget/Expenditure Statistics* which can be downloaded at <http://www.iea.org/stats/rd.asp>. The *IEA Guide* includes detailed information on what should be reported for each technology.

The IEA RD&D guidelines are largely inspired by the 2002 edition of the OECD *Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development*. The *Frascati Manual*, first published in 1962, is the key reference book on the subject of research and experimental development (R&D) measurement.

#### **General concepts related to R&D (Frascati Manual)**

**R&D** comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.

R&D covers three activities:

**Basic research:** the experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.

**Applied research:** the original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.

**Experimental development:** the systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

R&D excludes:

**Demonstration:** the design, construction, and operation of a prototype of a technology at or near commercial scale with the purpose of providing technical, economic and environmental information to industrialists, financiers, regulators and policy makers.

**Deployment:** the selection and use of a commercially available technology-based product or service in normal operations by businesses, individuals or government agencies with the aim of accelerating the diffusion and adoption of technologies or practices.

#### **Specificities of energy RD&D**

Energy RD&D reported under this manual should include the research, development, and demonstration as defined above when the work applies to technologies that are used to extract, convert, generate, transport, distribute, control, and use energy. Energy in this context should include

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<sup>4</sup> Countries are encouraged to use the computerised submission in order to facilitate and speed up work on the data. If you have any questions or problems using the files, please contact:  
Energy Statistics Division (Tel: 33 1 40 57 66 76); email: [slt@iea.org](mailto:slt@iea.org)

the entire chain from primary forms found in nature, through secondary forms more convenient for transport and storage, through to end uses such as heat, light, motive force, and other energy services. The IEA concept of Energy RD&D differs from the Frascati concept of R&D, in that: (i) it focuses on energy-related programmes only; (ii) it includes “demonstration projects”; and (iii) it includes state-owned companies.

The IEA has decided to include demonstration projects when collecting R&D budget data because quite often this is an important part of the development of new technologies. The project’s outcome may be uncertain and there is an element of risk that is often too large for the private sector to assume alone.

<b>Coverage</b>	<p>Energy <b>RD&amp;D</b> covers research, development and demonstration related to the production, storage, transportation, distribution and rational use of all forms of energy.</p> <p>Energy RD&amp;D covers:</p> <ul style="list-style-type: none"> <li>• Basic research when it is clearly oriented towards the development of energy-related technologies,</li> <li>• Applied research,</li> <li>• Experimental development,</li> <li>• Demonstration.(shown separately)</li> </ul> <p>For the purposes of energy RD&amp;D, state-owned companies should be considered as public bodies, but shown separately.</p> <p><i>Deployment should be <b>excluded</b> from RD&amp;D.</i></p>
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## TIPS TO FILLING IN THE QUESTIONNAIRE

The IEA asks that respondents complete the tables provided without making any alterations, as these are used directly for computer processing.

### Levels of information

The questionnaire comprises seven groups of energy-related RD&D topics:

- Energy efficiency
- Fossil fuels: oil, gas and coal
- Renewable energy sources
- Nuclear fission and fusion
- Hydrogen and fuels cells
- Other power and storage technologies
- Other cross-cutting technologies or research

For each of those groups, national data collectors should proceed as follows:

- (i) Group-level data correspond to the total budgets/expenditures allocated to corresponding activities.
- (ii) Data at the 2-digit level corresponds to a first breakdown of group-level data: the sum of all 2-digit level budgets/expenditures should match group-level budgets/expenditures. Every effort should be made to have complete information that adds up at this level.
- (iii) Similarly, data at the 3-digit level provide a breakdown of the 2-digit level categories and data at the 4-digit level provide a breakdown of the 3-digit level. The 3-digit and 4-digit levels will be more difficult to complete.

At each of the 2-digit, 3-digit and 4-digit levels, a category for unallocated budgets/expenditures has been provided. This category should be used in the event that budgets/expenditures cannot be allocated to one specific area at that level, and where it is not possible to estimate the split between two or more of the sub-categories.

### **Memo items**

The IEA RD&D questionnaire also requests data for new themes where RD&D is conducted across different technological groups. Those new themes are essential to the future of energy-related activities. Therefore, acquiring accurate data that are consistent among countries is essential to having a global and comprehensive view of these new technologies.

Memo items (currently limited to: (i) smart grids; (ii) electric vehicles; and (iii) energy storage) are calculated by adding budgets/expenditures already allocated to other categories, according to the table that can be found at the bottom of the questionnaire.

When parts of rows are required for the calculation of a memo item, the national data collector should allocate the most relevant figure, and avoid leaving a blank cell. Furthermore, it is possible that a country knows its spending figure on the new technology but does not know its breakdown between the IEA's current categorisation. In this case the memo item total should be reported on its own, without any breakdown.

### **Optional categories and the use of "Unallocated"**

The categories at the 3-digit and 4-digit level are optional and the unallocated categories may be used. However, as mentioned above, every effort should be made to avoid using the unallocated rows and to divide budgets/expenditures into "normal" categories whenever possible.

### **R&D column**

The R&D column contains budgets/expenditures on research and development. In previous questionnaires, this data was not collected separately but also included demonstration.

### **Demonstration column**

Demonstration data should not be included in general figures of R&D data, but entered in the separate column entitled "Demonstration". Although not usual, if demonstration data on budgets/expenditures are confidential, then demonstration can be added to the R&D column and not shown separately. However, this should be noted in the metadata. If accurate demonstration data cannot be found, then please consult the instructions below in "Treatment of missing information".

**RD&D for state-owned companies**

The R&D and demonstration data for state-owned companies should be given separately in the appropriate table. If, however, RD&D budgets/expenditures data for the state-owned companies are confidential, then the amounts may be reported with the rest of the RD&D data and this should be noted in the metadata. If, for whatever reason, state-owned companies are not included, then this should also be noted in the metadata.

**Currency**

RD&D figures should be entered in nominal million national currency units only.

For publication, the IEA Secretariat will convert the national currency units to USD (using exchange rates), to USD (using purchasing power parities) and to Euros (using exchange rates).

**Fiscal year vs. calendar year**

If the country does not report RD&D budgets/expenditures on a calendar year basis, then the fiscal year should be clearly indicated in the specified row.

**Multi-annual projects**

When reporting RD&D budgets, the *Frascati Manual* stipulates that multi-annual projects budgeted in only one year or over several years should be allocated to the data of the year(s) in which they are budgeted, not in the years of performance. Multi-annual programmes that are authorised at some stage but budgeted over several years should be allocated to the years in which they are budgeted, not the year of authorisation.

When reporting multi-year budgets, the budget profile (if available) should be used to distribute the funds over the years of the multi-annual project. If no budget profile is available, then the funds should be allocated equally over the years.

**Metadata**

Metadata should be added to the submission of data when it is believed that the information provided will help the reader to better understand limitations to the data (for example, where the category of data requested is not fully congruent with the data provided or where some significant change in the statistics could benefit from explanation). These metadata can be added to the “comments” tab in the questionnaire, provided in a text file or included in the email when the questionnaire is transmitted.

**Treatment of missing information**

If some information is missing when completing the questionnaire, please specify which of the following categories of non-response is most accurate:

- Budgets/expenditures are nil, i.e. no activity (“--“)
- Data are not available at this time (“n.a.”)

**Budgetary stage and actualisation of anterior data**

Although details of the budgetary procedure vary from country to country, seven broad stages can be identified:

- i) Forecasts (estimates of funding before beginning of budget discussion).
- ii) Budget forecasts (preliminary figures as requested by ministries, especially for inter-ministerial discussions).
- iii) Budget proposal (figures presented to the parliament for the coming year).
- iv) Initial budget appropriations (figures as voted by the parliament for the coming year, including changes introduced in the parliamentary debate).
- v) Final budget appropriations (figures as voted by the parliament for the coming year, including additional votes during the year).
- vi) Obligations (money actually committed during the year).
- vii) Actual outlays (money paid out during the year).

■  
Stages i)-iv) describe the government's intentions. The data for budgetary year  $y$  should be available as soon as possible after the end of year  $y - 1$ . It is suggested that the preliminary GBAORD data should be based on the first budget agreed between the government and the parliament, or stage iv). Some countries might even base their preliminary figures on stage iii). During the budgetary year, supplementary budgets may be voted, including increases, cuts and reallocations of R&D funding. These are reflected in stage v). Data should be available as soon as possible after the end of the budgetary year. It is suggested that the final GBAORD data should be based on final budget appropriations. Some countries may have to base their final figures on stages vi) or vii).

## APPENDIX

### DATA MANAGEMENT FOR THE COUNTRY REVIEW PROCESS

The annual cycle for the country review process follows the submission of SLT/CERT questionnaires that start to arrive in July. The material supplied in the questionnaire (including the data) provides the point of departure for the review visits and questions to clarify developments in energy supply, use or policy. In parallel to this SLT/CERT questionnaire submission process, the statisticians in national administrations start to send the annual fuel questionnaires to the Secretariat, which continue to arrive over the autumn and early winter. Each country will submit five questionnaires on fuel and electricity and only when the full set are present and checked can an energy balance be prepared for the country.

Each SLT/CERT questionnaire will also contain an energy balance for the most recent historical year. There are two reasons for this. Firstly, it enables those preparing the review visits or texts to have the latest provisional historical year data long before the authoritative data will be available from the annual fuel questionnaire process. It also enables the Secretariat to ensure that projections have been prepared using the IEA energy balance methodology. The Secretariat does this by comparing its energy balances as they become available towards the end of the year with the energy balances provided in the SLT/CERT questionnaires.

The comparison process often reveals important differences that are discussed with the submitting country and can lead to revisions to the forecasts provided. It is rare that it leads to revisions to the historical data submitted in the fuel questionnaires. The discussion of differences is particularly valuable for the Secretariat as it permits a fuller understanding of the data that will contribute to the questions to be raised in the review process.

At the time of the preparation of the final text for publication the IEA energy balance data are used for the historical parts of the key indicator tables as they are considered the authoritative national data.