International Energy Agency (IEA)

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The **International Energy Agency commenced** its operation in 1974 under the auspices of the Organization for Economic Co-operation and Development (OECD). The IEA is the energy forum for 26 Member countries, all from the OECD, to improve the world's energy supply and to promote reliable databases for energy-related information. IEA member governments are committed to sharing energy information, to co-ordinating their energy policies and to co-operating in the development of rational energy programs. IEA publishes monthly reports on electricity, natural gas, prices, and the oil market. The *World Energy Outlook* is the IEA's most comprehensive publication, and is considerd "the world's most authoritative source of energy market analysis and projections."

The main IEA sources used by IFs are the *World Energy Balances (WEB)* and *World Energy Statistics (WES)*, databases assocated with the *World Energy Outlook*. They contain variables such as the production, trade, and consumption of coal, oil, gas, electricity, heat, renewables, and waste for OECD countries and over 100 non-OECD countries.

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Data Acquisition

Unlike most data used in IFs, IEA data from the WEB and WES are not open source. The data must be purchased from the IEA and is delivered on two CD-ROMs.[1] Each disc runs on a database management software program called Beyond 20/20 that comes loaded on the

discs, along with the data. Financial support for the purchase of the IEA data is available from a University Library Association grant. Pardee successfully applied for grant funding through this program for the 2017 update with the help of staff at the Anderson Academic Commons at the University of Denver.

Documentation

Full documentation is available for each dataset detailing its contents, structure, definitions, geographical coverage, etc.

World Energy Balances 2016 Database Documentation

World Energy Statistics 2016 Database Documentation

Batch Pull

The IEA update is performed as a batch pull that includes **138 series** using the Batch Data Update feature in IFs. In the display, "IEA" is the Source and the "IEA Countries" country list is used for country concordance. For the Code Location in Source Data portion of the update form, the source Excel must be formatted so that each Code in Source term is in a different column. For example, SeriesEnImportsOilProductsIEA's Code in Source is "Imports.Oil products," so there should be two columns with "Imports" in one and "Oil products" in the next.

Series Codes

Because this is a batch pull, each series needs a Code in addition to a variable name to be imported. The Codes are listed in the DataDict, and should match the series name in the IEA source database. For the 2017 update, series on the WEB and WES discs were organized by two parameters, FLOW and PRODUCT, where FLOW is the first term of the Code and PRODUCT is the second term of the Code. [NOTE: Drag and drop FLOW, PRODUCT, UNIT, and COUNTRY to column and row headers to reconfigure the display in Beyond 20/20.]

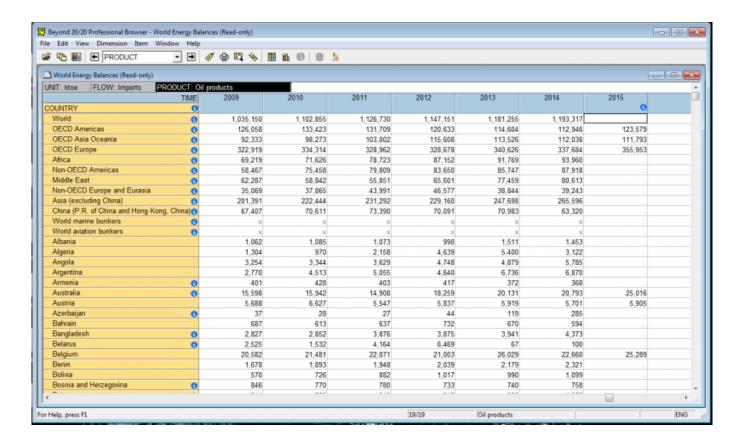
Example

Variable: EnImportsOilProductsIEA

Code: Imports.Oil products

FLOW: Imports

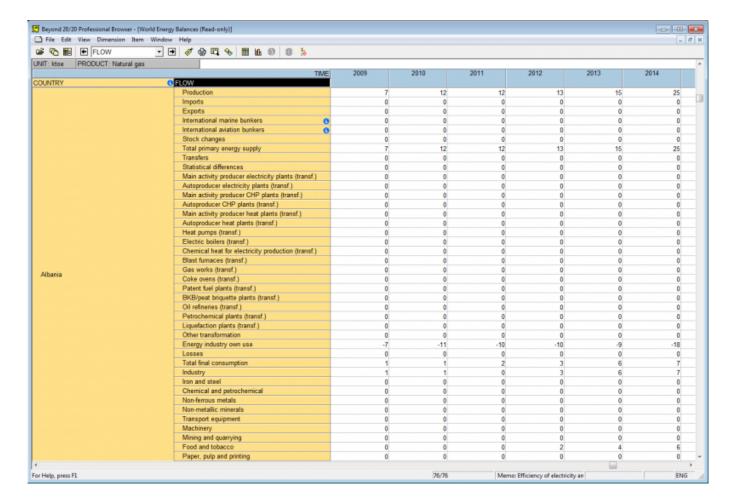
PRODUCT: Oil products



Pulling and Formatting the Data

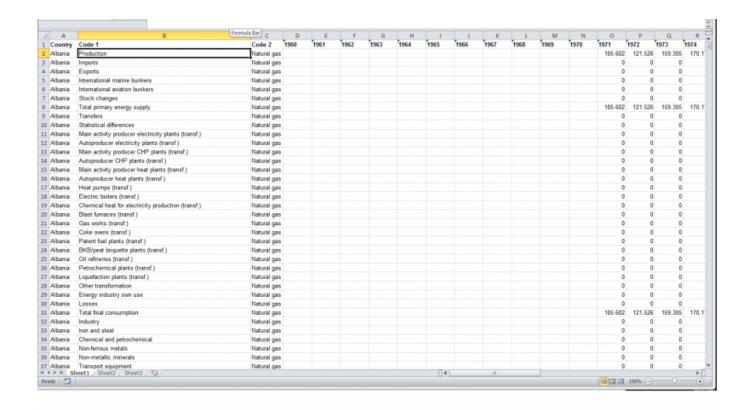
Pulling

Ideally, the IEA series are pulled from the discs in bulk. As of the 2017 update, Beyond 20/20 limits the number of records that can be exported at one time, preventing all the data from being exported at once; however, it is possible to pull all records by PRODUCT or FLOW. For example, it is possible to pull all natural gas or oil products series at once from the WEB disc. Pull the data by assembling the correct configuration in Beyond 20/20, then going to File>Save As and saving it as a .xls file. It is also possible to copy and past individual (or a few) series into an Excel by highlighting them, but not a large number of series at once. [NOTE: The directly exported Excel file did not work on Pardee computers due to a policy setting issue, so the data had to be copied and pasted into a new sheet to be manipulated]



Formatting

Once the series have been pulled by PRODUCT or FLOW, they need to be cleaned. Missing data are marked with a "..", "x", or "n," so remove these with a Find+Replace. The data can then be imported with the Batch Import tool using the Codes assocated with the FLOW and PRODUCT, along with the country name. It may be necessary to also clean the Codes, for example if there is a unit listed parenthetically after the name of the product (i.e. "Solar thermal (TJ-net)").



Conversions

Most of the necessary conversion for these series are done automatically through the Batch Import form. However, 22 series had to be converted manually for the the 2017 update from terajoules (TJ) to kilotones of energy equivalent (ktoe). The conversion factor used for these series is from the IEA Unit Converter: TJ value*0.0238845897. These series include:

EnConBiogasIndustrialIEA

EnConBiogasOtherIEA

EnConBiogasTotIEA

EnConBiomassIndustrialIEA

EnConBiomassOtherIEA

EnConBiomassResidentialIEA

EnConBiomassTotIEA

EnConBiomassTransportIEA

EnConSolarThermalTotIEA

EnConSolarThermIndustrialIEA

EnConSolarThermOtherIEA

 ${\tt EnConSolar Therm Residential IEA}$

EnExportsBiomassIEA

EnExpProdBiogasCDIEA

EnExpProdIndustrialWasteCDIEA

EnExpProdMunicipalWasteNonRenewableCDIEA

EnExpProdMunicipalWasteRenewableCDIEA

EnExpProdnonspecPrimaryBiomassWasteCDIEA

EnExpProdSolarThermalCDIEA

EnImportsBiomassIEA EnProdBiomassIEA EnExpProdnonspecPrimaryBiomassWasteCDIEA

DataDict

Variable: Variable names were not changed from previous years this data was pulled, and no additional variables were added for the 2017 pull.

Table: These were not changed from previous years this data was pulled.

Code in Source: These were not changed from previous years this data was pulled.

Groups: These were not changed from previous years this data was pulled.

Subgroups: These were not changed form previous years this data was pulled.

Definitions and Units: These were not changed from previous years this data was pulled.

Extended Source Defn: All were marked as "No Extended Source" for 2017 pull.

Units: These were not changed from previous years; the units used in this dataset are BBOE and GwHr.

Years: Years for every series were changed to available data provided through the database. Most series begin in 1960 with the exception of EnExportsOilIEA, EnImportsOiliEA, and EnProdOilIEA, which begin in 1971. All extend through either 2014 or 2015 as of the 2017 update.

Source: The source name used in the 2017 update for all batch pull IEA series is "IEA (International Energy Agency) Batch Pull."

Original Source: The original source used in the 2017 update for all series is the "World Energy Outlook."

Notes: Notes were updated to reflect the source disc for the series (WEB or WES), any conversion factors used, and the appropriate initials.

Aggregation: Aggregations were not changed from pervious updates.

Disaggregation: Disaggregations were not changed from previous updates.

Name in source: Names were updated based on the name of each variable as it is displayed in the Beyond 20/20 database format; generally matches the Code in Source.

Decimal places: These were not changed from previous years this data was pulled.

Country Concordance: IEA Countries were used (and updated for the 2017 pull, see below).

Formula: These were not changed from previous years this data was pulled, and are either blank or convert data to BBOE or GwHr.

Preprocessor Series

Of the 138 IEA Batch Pull series, 24 are preprocessor. These series should be first priority in any IEA batch update. They include:

EnExportsCoalIEA

EnExportsNatGasIEA

EnExportsOilIEA

EnExportsOilProductsIEA

EnExportsPeatIEA

EnExportsTotalIEA

EnImportsCoalIEA

EnImportsNatGasIEA

EnImportsOilIEA

EnImportsOilProductsIEA

EnImportsPeatIEA

EnImportsTotalIEA

EnProdBiodiesellEA

EnProdBiogasIEA

EnProdCoalIEA

EnProdGeothermIEA

EnProdHydroIEA

EnProdNatGasIEA

EnProdNuclearIEA

EnProdOilIEA

EnProdSolarPhotoIEA

EnProdSolarThermIEA

EnProdTideWaveOceanIEA

EnProdWindIEA

Non-Preprocessor Series

There are 114 nonpreprocessor series included in the IEA update. They include:

EnConBiodieselTotIEA

EnConBiodieselTransportIEA

EnConBiogasIndustrialIEA

EnConBiogasolineTotIEA

EnConBiogasolineTransportIEA

EnConBiogasOtherIEA

EnConBiogasTotIEA

EnConBiomassIndustrialIEA

EnConBiomassOtherIEA

EnConBiomassResidentialIEA

EnConBiomassTotIEA

EnConBiomassTransportIEA

EnConCoalIndustrialIEA

EnConCoalOtherIEA

EnConCoalResidentialIEA

EnConCoalTotIEA

EnConCoalTransportIEA

EnConCombustRenewWasteIndustrialIEA

EnConCombustRenewWasteOtherIEA

EnConCombustRenewWasteResidentialIEA

EnConCombustRenewWasteTotIEA

EnConCombustRenewWasteTransportIEA

EnConElecIndustrialIEA

EnConElecOtherIEA

EnConElecResidentIEA

EnConElecTotIEA

EnConElecTransportIEA

EnConGeothermIndustrialIEA

EnConGeothermOtherIEA

EnConGeothermResidentialIEA

EnConGeothermTotIEA

EnConNatGasIndustrialIEA

EnConNatGasOtherIEA

EnConNatGasResidentialIEA

EnConNatGasTotIEA

EnConNatGasTransportIEA

EnConOtherBiofuelsIndustrialIEA

EnConOtherBiofuelsTotIEA

EnConOtherBiofuelsTransportIEA

EnConSolarThermalTotIEA

EnConSolarThermIndustrialIEA

EnConSolarThermOtherIEA

EnConSolarThermResidentialIEA

EnExportsBiodieselIEA

EnExportsBiogasolineIEA

EnExportsBiomassIEA

EnExportsCombustRenewWastelEA

EnExportsElecGwHrIEA

EnExportsElecIEA

EnExportsOtherBiofuelsIEA

EnExpProdBioDieselsCDIEA

EnExpProdBiogasCDIEA

EnExpProdBiogasolineCDIEA

EnExpProdCharcoalCDIEA

EnExpProdIndustrialWasteCDIEA

 ${\tt EnExpProdMunicipalWasteNonRenewableCDIEA}$

EnExpProdMunicipalWasteRenewableCDIEA

EnExpProdnonspecPrimaryBiomassWasteCDIEA

EnExpProdOtherLiquidbiofuelsCDIEA

EnExpProdOtherSourcesCDIEA

EnExpProdPrimarySolidGasCDIEA

EnExpProdSolarThermalCDIEA

EnExpProdSPVCDIEA

 ${\tt EnExpProdTideWaveOCeanCDIEA}$

EnExpProdWindCDIEA

EnImportsBiodieselIEA

EnImportsBiogasolineIEA

EnImportsBiomassIEA

EnImportsElecGwHrIEA

EnImportsElecIEA

EnImportsOtherBiofuelsIEA

EnOutputElecCoalCDIEA

En Output Elec Combustible Renewable Waste CDIEA

EnOutputElecCrudeNGLFeedstocksCDIEA

EnOutputElecElectricityCDIEA

EnOutputElecGasCDIEA

EnOutputElecGeothermalCDIEA

EnOutputElecHeatCDIEA

EnOutputElecHydroCDIEA

EnOutputElecNuclearCDIEA

EnOutputElecOilProductsCDIEA

EnOutputElecPeatCDIEA

EnOutputElecSolarWindOtherCDIEA

EnOutputElecTotalCDIEA

EnProdBiogasolineIEA

EnProdBiomassIEA

EnProdCoalCDIEA

EnProdCombustibleRenewableWasteCDIEA

EnProdCombustRenewWasteIEA

EnProdCrudeNGLFeedstocksCDIEA

EnProdElectricityCDIEA

EnProdGasCDIEA

EnProdGeothermalCDIEA

EnProdHeatCDIEA

EnProdHydroCDIEA

EnProdNuclearCDIEA

EnProdOilProductsCDIEA

EnProdOtherBiofuelsIEA

EnProdPeatCDIEA

EnProdSolarWindOtherCDIEA

EnProdTotalCDIEA

EnTPESCoalCDIEA

EnTPESCombustibleRenewableWasteCDIEA

EnTPESCrudeNGLFeedstocksCDIEA

EnTPESElectricityCDIEA

EnTPESGasCDIEA

EnTPESGeothermalCDIEA

EnTPESHeatCDIEA

EnTPESHydroCDIEA

EnTPESNuclearCDIEA

EnTPESOilProductsCDIEA

EnTPESPeatCDIEA

EnTPESSolarWindOtherCDIEA

EnTPESTotalCDIEA

Country Concordance

There is a unique country concordance table for the IEA series called "IEA Countries." This table should be checked for accuracy at the time of each update. For the 2017 update, the following countries had to be updated (to the form listed):

Bosnia and Herzegovina
Democratic Republic of the Congo
Hong Kong (China)
Democratic People's Republic of Korea
Libya
Moldova
Mauritius
Niger
Suriname
South Sudan
Tanzania

Viet Nam

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This page was last edited on 10 September 2018, at 23:54.