

METHODOLOGICAL DIFFERENCES OF OLADE'S AND IRES' ENERGY BALANCES

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Monitoring progress towards energy transitions in Latin America and the Caribbean
The Role of Energy Statistics and Indicators
Lima Centro de Convenciones (LCC), November 11th, 2019

Program for Strengthening the Management and Dissemination of Energy Information for Sustainable Development in Latin America and the Caribbean



Funded by



Partners:



Objective

To strengthen the capacity of OLADE and LAC countries to **manage, disseminate and deliver** energy information related to the *energy chain, prices, reserves, potential and infrastructure, to sustainable energy development in the dimensions of gender issues and energy; energy and climate change; energy efficiency; access, and renewables.*

Core idea: "Improve LAC Energy Information Systems under a unique platform in order to obtain relevant, consistent, comprehensive, reliable, harmonized and comparable energy data"

International Recommendations for Energy Statistics

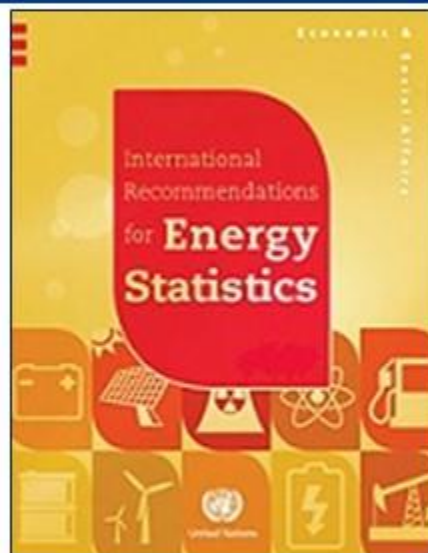
- IRES were prepared in 2006, in response to a request of the UN Statistics Commission
- IRES were built by:
 - OSLO Group on Energy Statistics (Countries)
 - Inter-secretarial Group on Energy Statistics (Organizations)

Objective

- Review United Nations manuals on energy statistics
- Develop energy statistics as part of official statistics
- Harmonize energy definitions and compilation methodologies
- Develop international standards for energy statistics



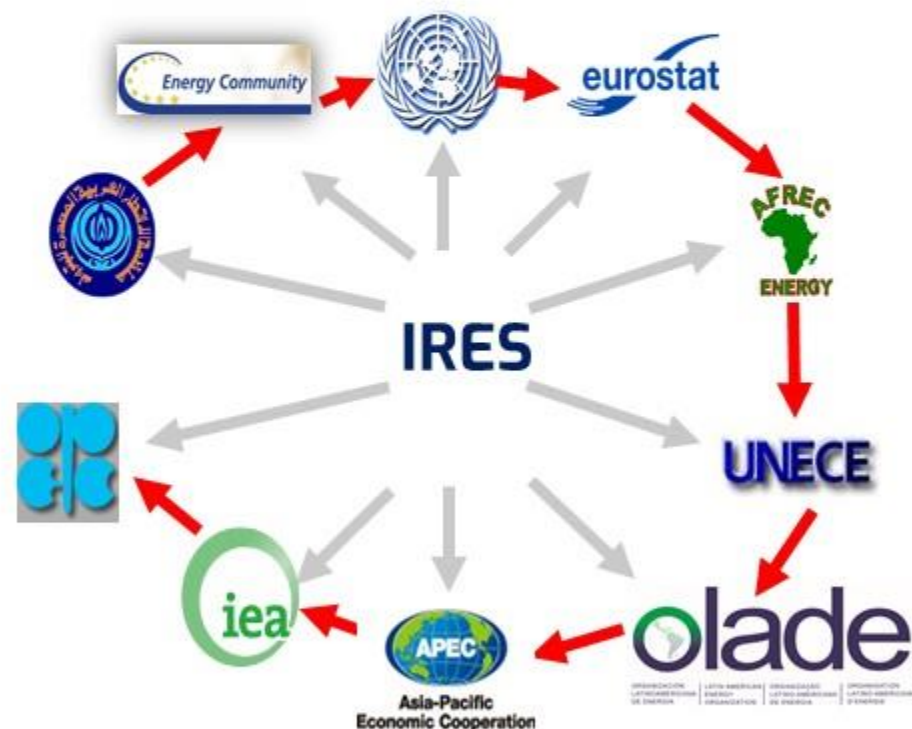
About IRES



- Product concepts
- Activities concepts
- Harmonized definitions
- Classifications
 - Standard International Energy Product Classification (SIEC)
 - International Standard Industrial Classification (ISIC)

In english: <https://unstats.un.org/unsd/energy/ires/IRES-web.pdf>

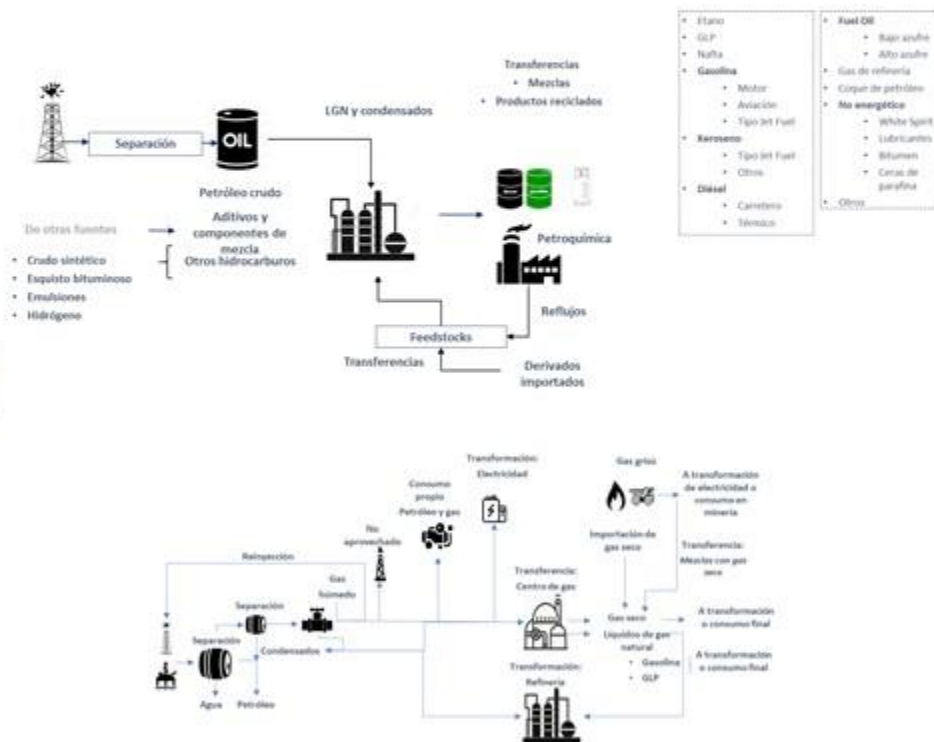
En español: <https://unstats.un.org/unsd/energy/ires/IRES-es.pdf>



Nos une la **energía**
Energy joins us

Objective of the Harmonization Process

Harmonize methodologies for products and energy flows with IRES methodology but without losing the statistical heritage that the region and OLADE have



International Energy Agency's support

Energy Statistics Week (February 2018) – Quito, Ecuador

- Technical discussion with IEA, JODI y countries (Argentina, Brasil, Colombia, Ecuador, Perú y Uruguay) about the harmonization process
- OLADE – IEA workshop on IRES methodology and the harmonization process

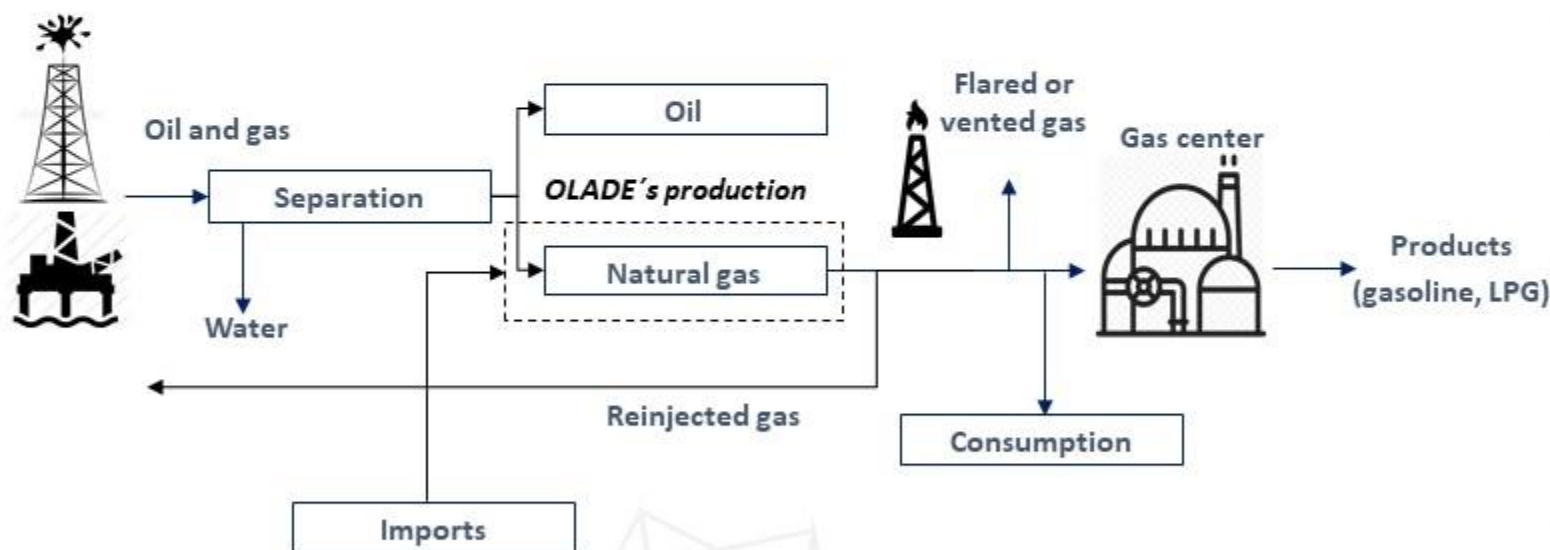


OLADE – IEA Workshop (February 2019) – Paris, France

- Discussion on the proposal of a new methodology for natural gas, natural gas liquids and condensates
- Review of new annual questionnaire for information collection
- Review of methodological sheets

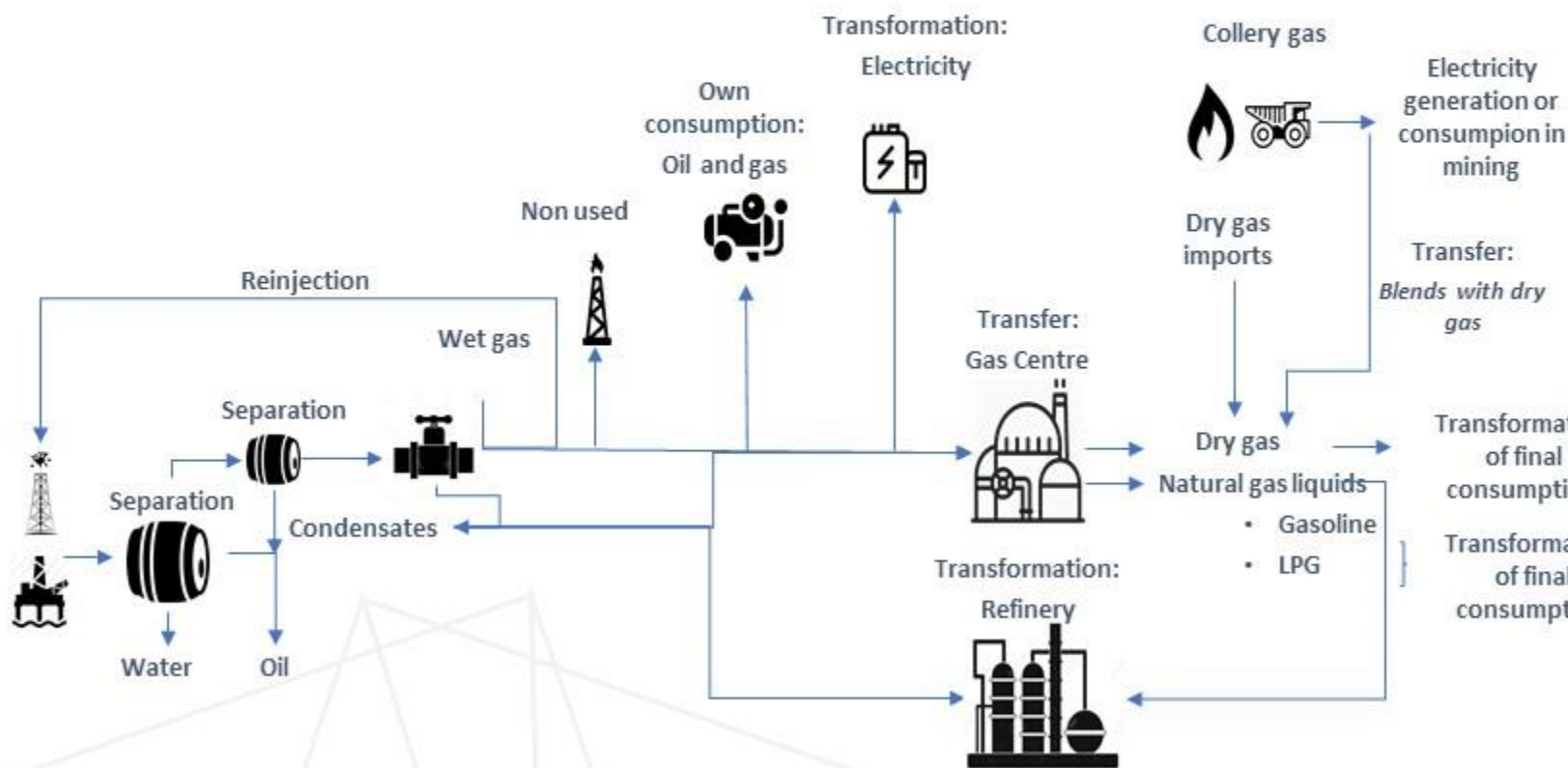


Current OLADE's methodology for natural gas



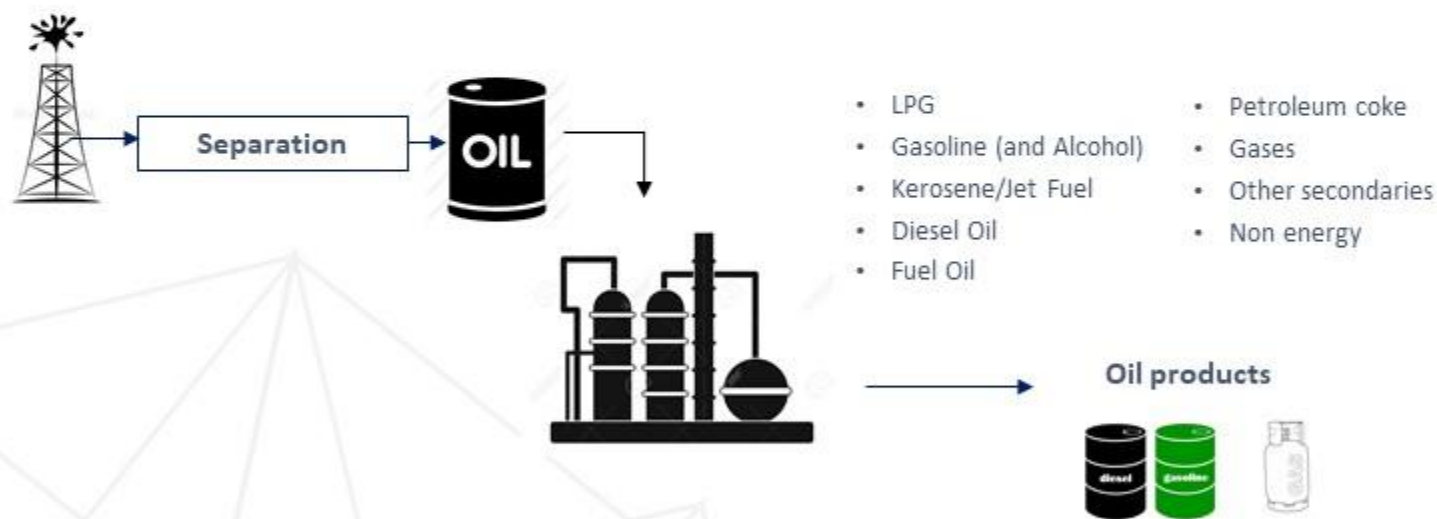
- One type of natural gas is considered currently
- One standard calorific value for natural gas chain is used
- Production considers natural gas after separation of water
- *Natural gas production includes condensates (possible of double counting of condensates since these can be blended with the oil chain)*
- Natural Gas Liquids are not considered for the energy balance
- Production of gasoline, LPG are considered as output (secondary energy) of gas centres

New proposal for Natural Gas Methodology for harmonization OLADE - IRES



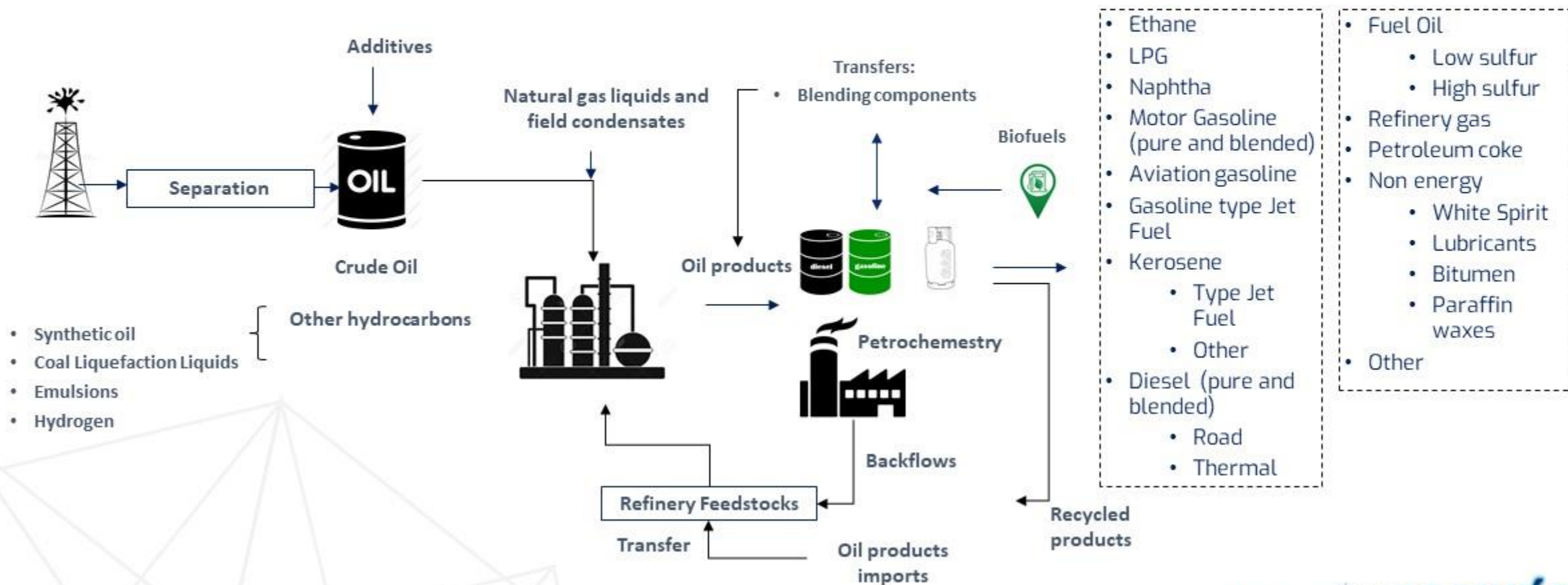
- 2 types of natural gas: Wet gas and dry gas
- Production of Wet gas considers natural gas after separation of water and field condensates
- Double counting of field condensates is avoided since condensates are transferred to the oil chain
- Wet gas can be consumed by autoproducers and in the oil and gas industry
- Dry gas considers the gas output of gas centres as well as imports (dry gas equivalent)
- Dry gas can be consumed in all activities
- Reporting of Natural Gas production for IRES will be the wet gas consumed in autoproducers and in O&G industry and the production of dry gas in gas centres
- Natural Gas Liquids will be considered as the output of condensates (LPG, Gasoline) of Gas centres as well as recovered condensates in pipelines

Current methodology for Oil and Oil products



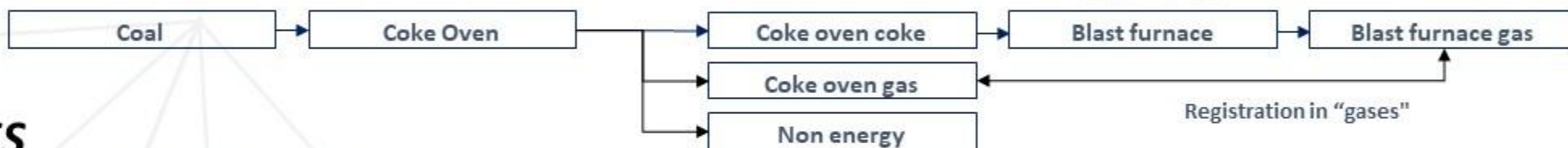
- Oil production considers production after separation of associated gas and water
- Field condensates are part of oil production
- One type of primary oil is considered
- No transfer flows are considered (blends, backflows, recycled products), including biofuels and additives
- Less disaggregation of oil products compared with IRES

New methodology for harmonization of oil and oil products OLADE - IRES

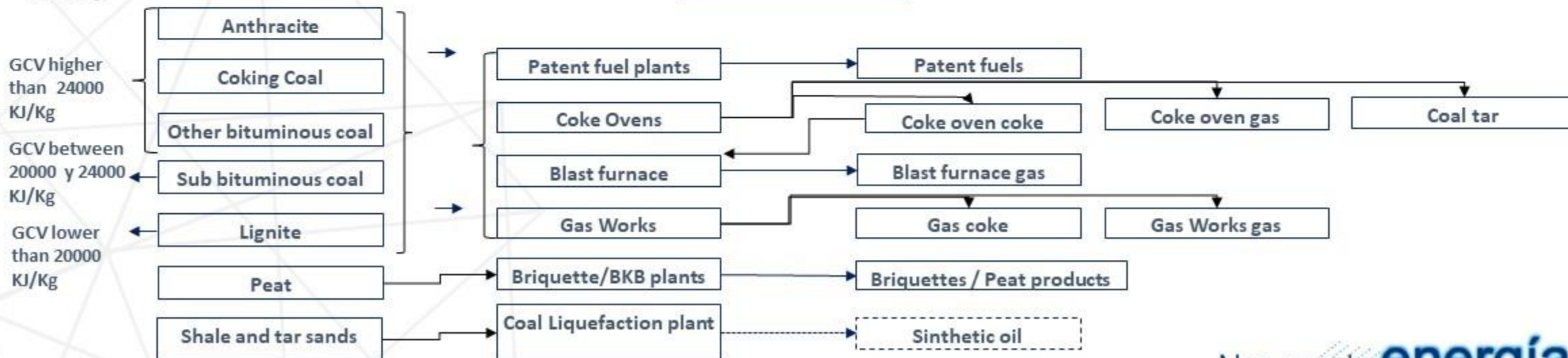


Coal and Coal products chain differences

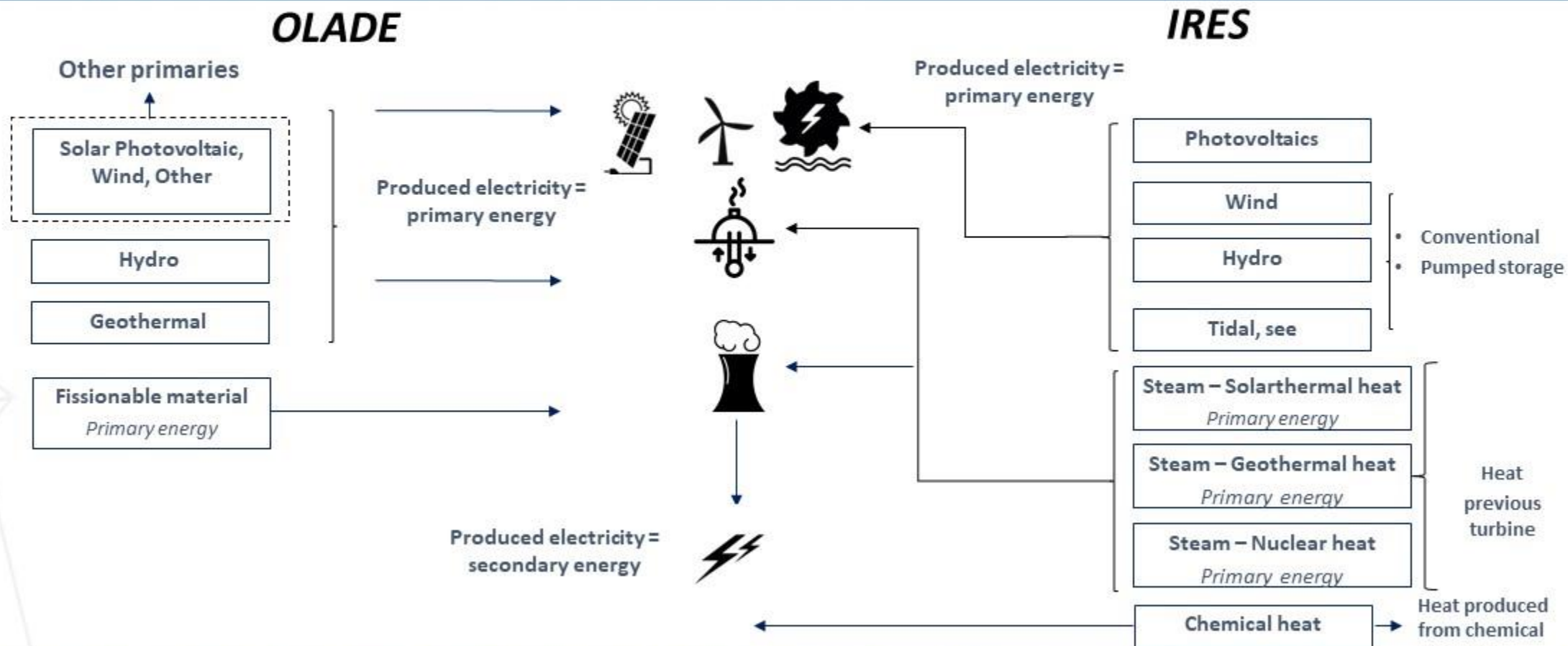
OLADE



IRES



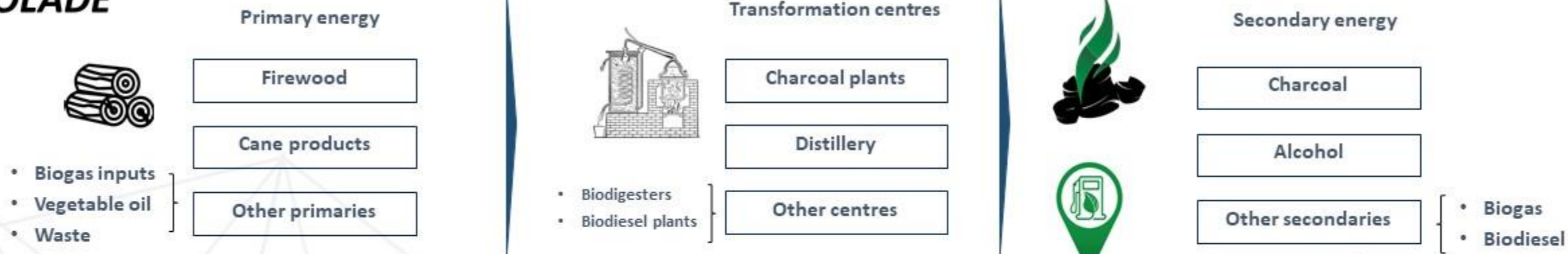
Electricity and renewables chain differences



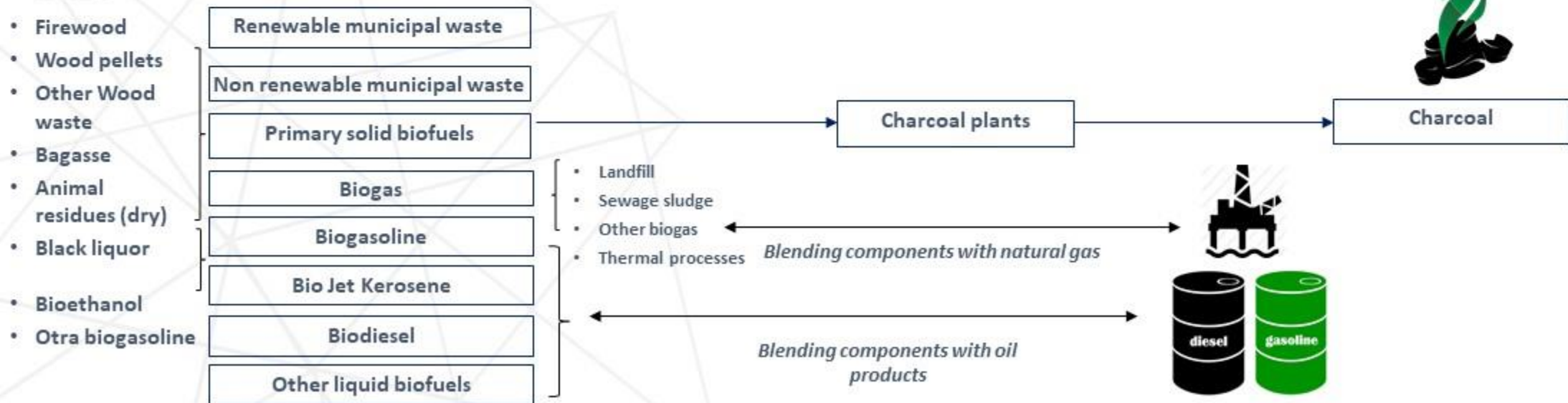
*When the heat previous the generation turbine is not measured, it can be approximated with an efficiency of 33% and 10% for nuclear and geothermal, respectively

Biofuels and waste chain differences

OLADE



IRES



Activities

IRES

Activities:

- Production → Values that are "ready to use"
 - Imports
 - Exports
 - International marine bunkers
 - International aviation bunkers
- Usually, countries don't take in account this informations (it is registered in transport or exports)*
- Stock changes
 - **Domestic Suplpy**
 - Transfers → OLADE doesn't take in account this activity
 - Statistical difference
 - **Transformation processes***
 - **Energy Industry own use***
 - Losses
 - **Final consumption**
 - Industry*
 - Transport*
 - Other*
 - Non energy use*
- Dissagregation in sub sectors based on ISIC Rev. 4*

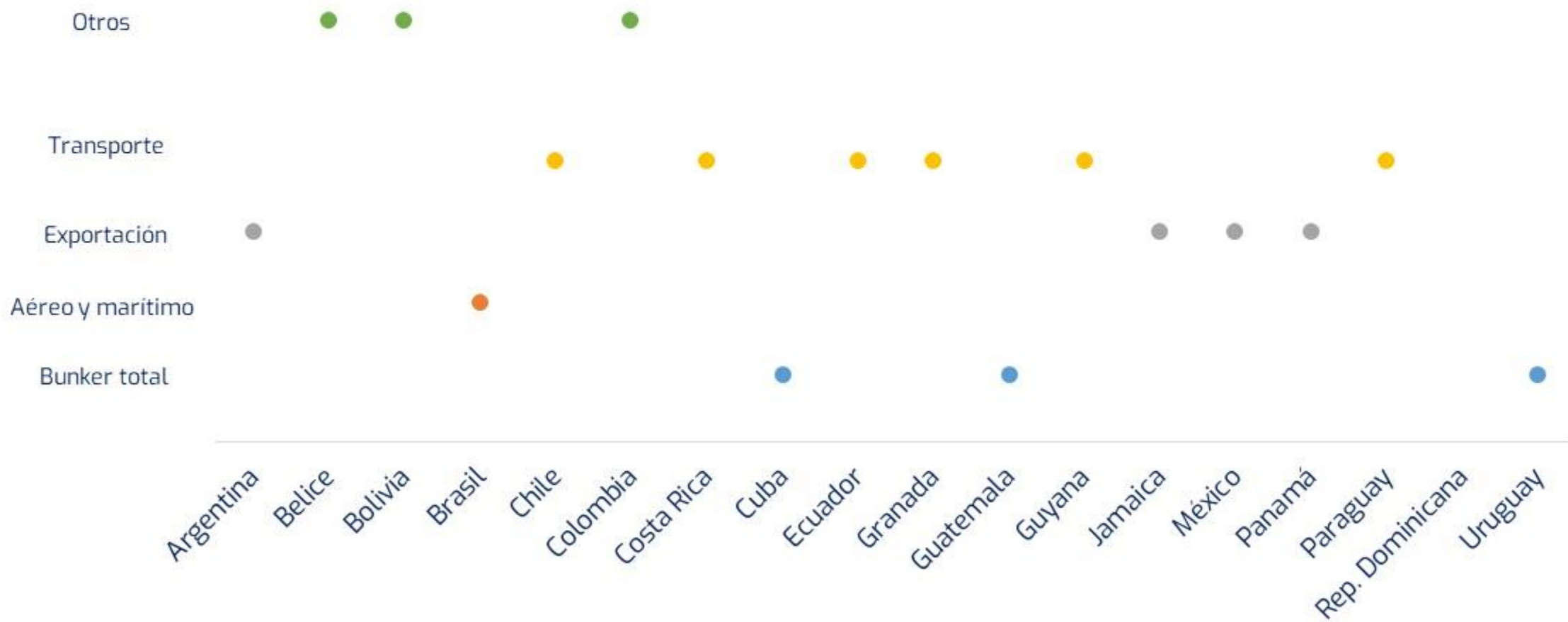
*Dissagregated activities in the energy balance

OLADE

Activities:

- Production → Production includes non used energy (flared, reinjection)
 - Imports
 - Exports
 - Stock changes
 - Non used
 - **Internal supply**
 - **Total transformación***
 - Transport
 - Industry
 - Residential
 - Commercial and public services
 - Agriculture, forestry and fishing
 - Mining
 - Construction and other
 - **Total energy consumption**
 - Non energy use
 - **Final consumptpion**
 - Own consulpion
 - Losses
 - **Statiscal difference**
- No disaggregation in economic sub sectors
Differences with IEA*

Bunkers



Energy consumption

Energy industry own use (ISIC REV 4 / Division 05,06, 19 y 35)

- Coal mines
- Oil and gas extraction
- Patent fuel plants
- Coke ovens
- Gas works
- Gasification plants for biogases
- Blast furnaces
- Peat briquette plants
- Oil refineries
- Coal liquefaction plants
- Liquefaction / regasification plants
- Gas to liquids plants
- Own use in electricity, CHP and heat plants
- Pumped storage plants
- Nuclear industry
- Charcoal production plants
- Other

Industrial:

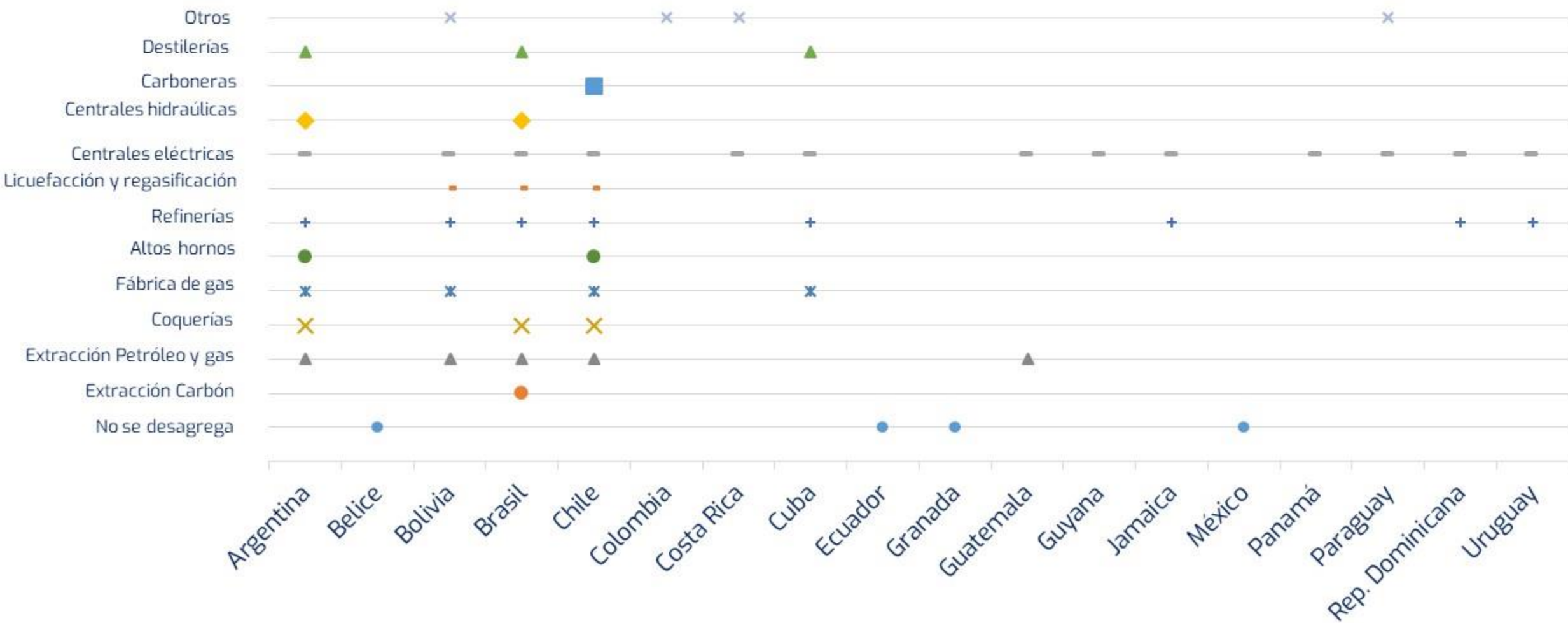
- 1. Iron and Steel
- 2. Chemical and petrochemical
- 3. Non – ferrous metals
- 4. Non – Ferrous metals
- 5. Transport equipment
- 6. Machinery
- **7. Mining and quarrying** → *OLADE registrers mining as separated sector*
- 8. Food and tobacco
- 9. Paper, pulp and print
- 10. Wood and Wood products
- **11. Construction** → *OLADE registrers construction as separated sector*
- 12. Textiles and leather
- 13. Other

Transportation (Division 49 a 51)

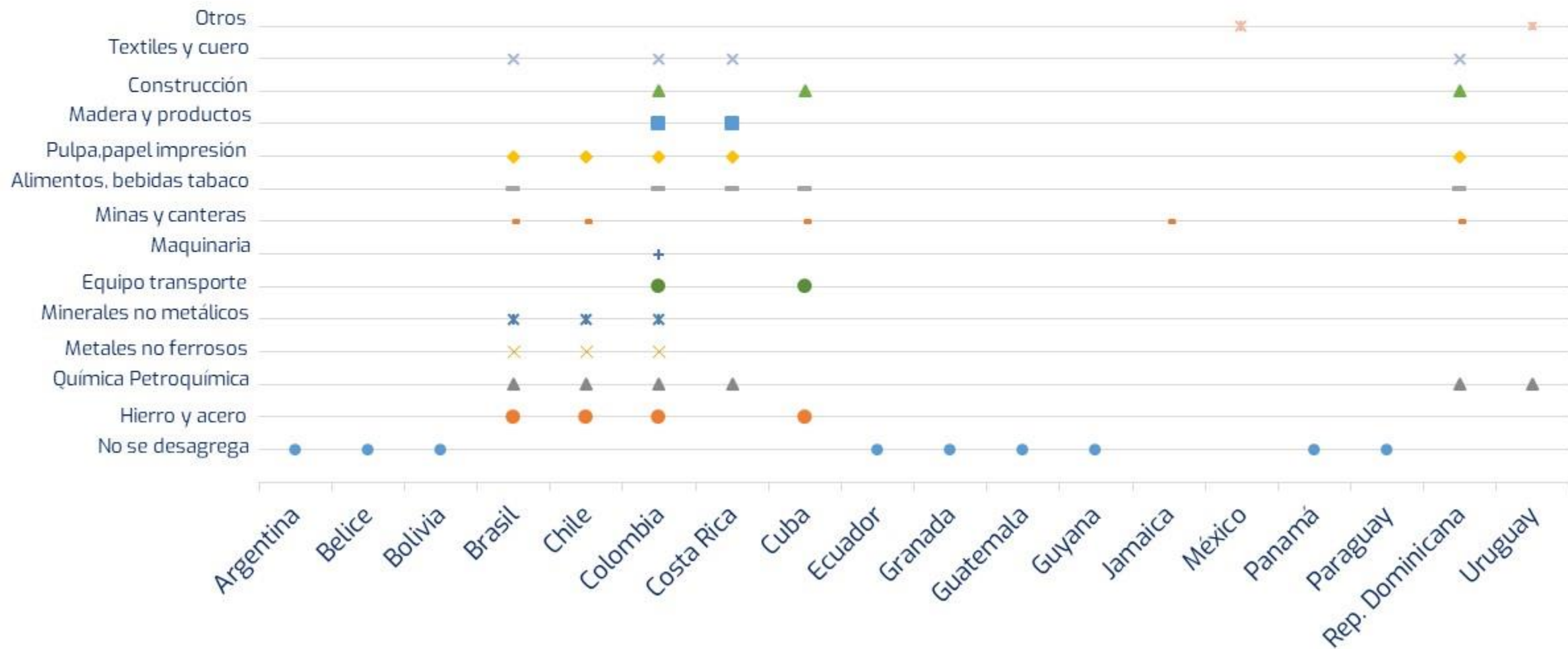
Dissagregation based on:

- Road
- Domestic aviation
- Rail
- **Pipeline transport** → *OLADE registrers pipeline as part of the energy industry own use*
- Domestic navigation
- Other

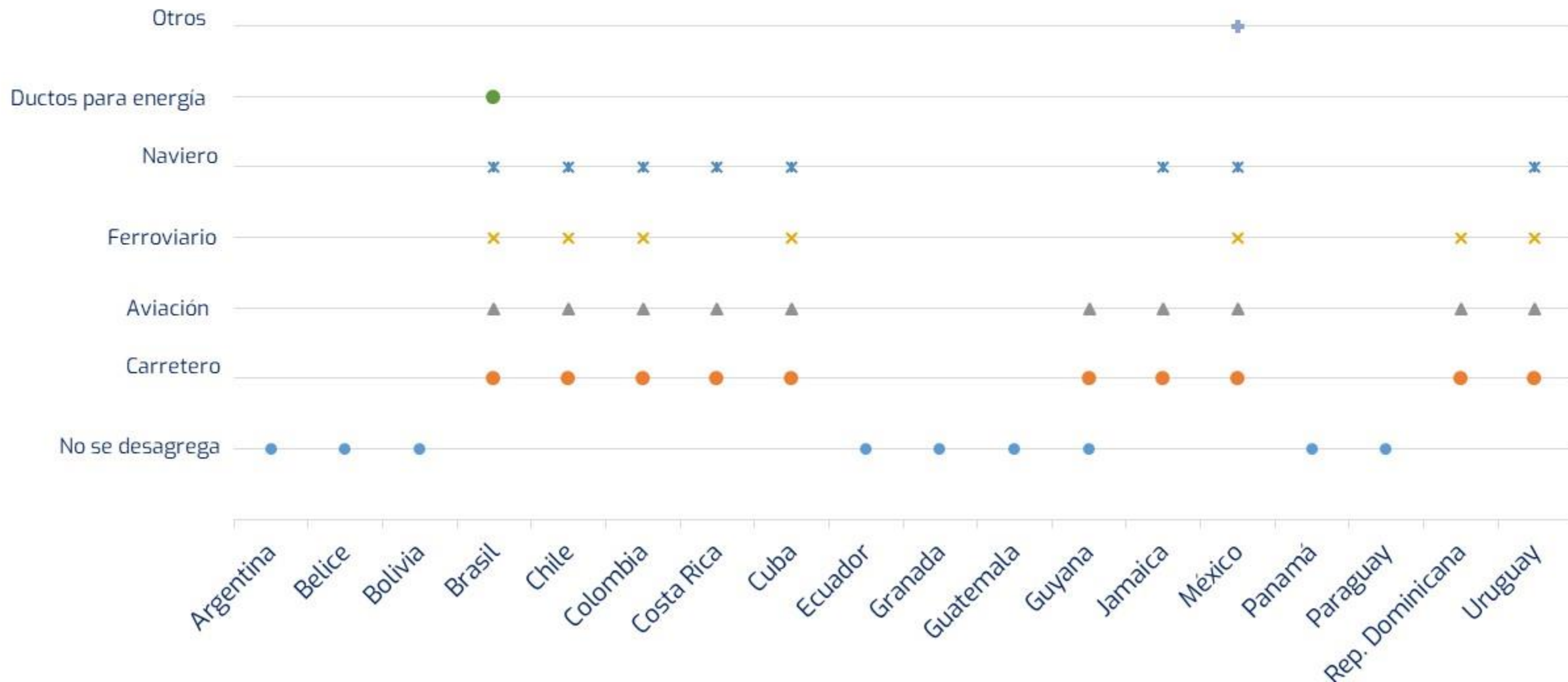
Dissagregation of own consumption



Dissagregation of industrial consumption



Dissagregation of transportation consumption



Summary of improvements

General Activities

- Dissagregation of marine and air bunkers
- Dissagregation of consumption activities based on ISIC Rev. 4

Natural gas, Oil and Oil products

- Dissagregation of oil types
- Inclusion of additives chain
- New methodology for natural gas
- Inclusion of condensates and Natural Gas Liquids chain
- Inclusion of transfers (interproduct, product, backflows)
- Dissagregation of oil products types

Coal and Coal products

- Dissagregation of coal based on the calorific value
- Inclusion of new primary and secondary products, as well as new transformation centres

Electricity, Heat and Renewables

- Dissagregation of energy types like fotovoltaics, wind, solar thermal, geothermal
- Harmonization of concepts for registration of electricity production for hydropower, geothermal, nuclear
- Dissagregation of biofuels' blends with oil products
- Inclusion of heat chain (not relevant in LAC)

New annual questionnaire

The table is a large grid with multiple columns grouped into sections. The main sections are color-coded: Basic data (light blue), Production (light orange), Consumption (light green), and Market share (light grey). Each section contains numerous sub-headers and rows for data entry. The table is mostly empty, suggesting it is a template or a partially completed questionnaire.

Methodological sheets

FICHA METODOLÓGICA PARA REGISTRO DE INFORMACIÓN

Electricidad y Calor

- UNIDADES**
- Unidades Físicas**
- Electricidad primaria y secundaria: Gigavatios hora (GWh)
 - Calor primario y secundario: $\text{Gcal}(\text{Gcal})$, (T)
 - Cargas para generación de electricidad y calor:
 - MWh por generación de electricidad (MWh)
 - MWh por generación de calor (MWh)
- Unidades Energéticas o Calóricas**
- $\text{Gcal}(\text{Gcal})$, (T)

El registro se realizará con signos matemáticos positivos, a excepción de:

- SIGNOS MATEMÁTICOS DE REGISTROS DE INFORMACIÓN**
- **Centros de Transformación:** Se registrará con signo negativo las cargas de energéticos en la fila de transformación (en la columna del energético); mientras que las salidas de electricidad y calor se reportarán con signo positivo en la columna de electricidad y calor correspondiente respectivamente.

Nota:
No se considera variación de inventario, ni transferencias o mezclas en el registro de electricidad y calor.

Para realizar el registro de la producción de electricidad, se dispone de la columna denominada "Electricidad" en la matriz de recolección de información, la cual debe ser llenada con signo positivo de acuerdo al centro de transformación correspondiente (ver sección Centros de transformación).

REGISTRO DE ELECTRICIDAD

Para comprender las fuentes de generación eléctrica, se debe diferenciar lo siguiente:

- Electricidad proveniente de fuentes naturales (denominada electricidad primaria)

FICHA METODOLÓGICA PARA REGISTRO DE INFORMACIÓN

Carbón y Productos de Carbón

- UNIDADES**
- Unidades Físicas**
- Carbón Primario: miles de toneladas métricas (kt)
 - Productos de carbón:
 - Sólidos: miles de toneladas métricas (kt)
 - Gas: $\text{Gcal}(\text{Gcal})$, (T)
- Unidades Energéticas o Calóricas**
- $\text{Gcal}(\text{Gcal})$, (T)

Nota:
Para la conversión de unidades físicas a calóricas de mezclas en la elaboración del balance energético, y en caso de que el país no posea el valor del poder calorífico de esta mezcla, se utilizarán promedios ponderados.

El registro se realizará con signos matemáticos positivos, a excepción de:

- SIGNOS MATEMÁTICOS DE REGISTROS DE INFORMACIÓN**
- **Variación de inventario:** Se obtendrá el signo (positivo o negativo) de la diferencia entre el stock a inicio del año y a finales del mismo año.
 - **Centros de Transformación:** Se registrará con signo negativo las cargas de energéticos en la fila de transformación (en la columna del energético); mientras que las salidas de productos se reportarán con signo positivo en la columna del energético secundario correspondiente.
 - **Mezclas:** Cuando un combustible es mezclado con otro energético, se registrará con signo negativo el descenso en la columna de dicho combustible y con signo positivo el incremento en la columna correspondiente al otro componente o mezcla.

La recolección de información se desagregará entre los siguientes tipos de carbón primario:

FICHA METODOLÓGICA PARA REGISTRO DE INFORMACIÓN

Gas Natural, Condensados y Líquidos de Gas Natural

- UNIDADES**
- Unidades Físicas**
- Gas Natural: millones de metros cúbicos (Mm³) - condiciones estándar (temperatura de 25°C y presión de 1 atm)
 - Gas Natural licuado (importado o exportado): millones de metros cúbicos (Mm³) - en base a un equivalente $\text{Gcal}(\text{Gcal})$, (T)
 - Líquidos de gas natural: miles de toneladas métricas (kt)
 - Condensados: miles de toneladas métricas (kt)

Unidades Energéticas o Calóricas

- $\text{Gcal}(\text{Gcal})$, (T)

Nota:
Para la conversión de unidades físicas a calóricas de mezclas en la elaboración del balance energético, y en caso de que el país no posea el valor del poder calorífico de esta mezcla, se utilizarán promedios ponderados.

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 - **Mezclas:** Cuando un combustible es mezclado con otro energético, se registrará con signo negativo el descenso en la columna de dicho combustible y con signo positivo el incremento en la columna correspondiente al otro componente o mezcla.

FICHA METODOLÓGICA PARA REGISTRO DE INFORMACIÓN

Petróleo y Derivados

- UNIDADES FÍSICAS Y ENERGÉTICAS**
- Unidades Físicas**
- Petróleo crudo y Otros petróleo: miles de toneladas métricas (kt)
 - Aditivos y componentes de mezcla: miles de toneladas métricas (kt)
 - Derivados de petróleo: miles de toneladas métricas (kt)
- Unidades Energéticas o Calóricas**
- $\text{Gcal}(\text{Gcal})$, (T)

Nota:
Para la conversión de unidades físicas a calóricas de mezclas en la elaboración del balance energético, y en caso de que el país no posea el valor del poder calorífico de esta mezcla, se utilizarán promedios ponderados.

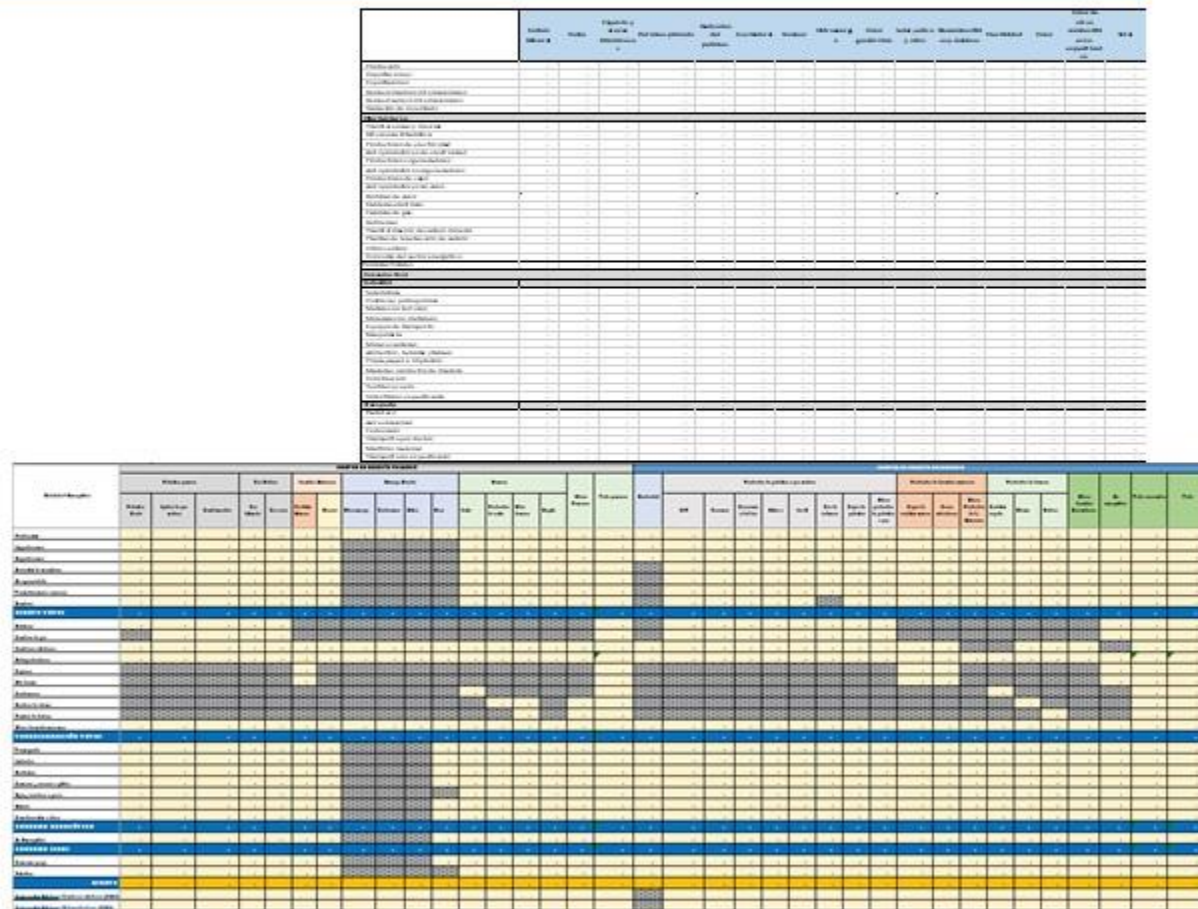
El registro se realizará con signos matemáticos positivos, a excepción de:

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- **Variación de inventario:** Se obtendrá el signo (positivo o negativo) de la diferencia entre el stock a inicio del año y a finales del mismo año.
 - **Centros de Transformación:** Se registrará con signo negativo las cargas de energéticos en la fila de transformación (en la columna del energético); mientras que las salidas de productos se reportarán con signo positivo en la columna del energético secundario correspondiente.
 - **Transferencias y Mezclas:** Cuando un combustible es transferido o mezclado con otro energético, se registrará con signo negativo el descenso en la columna de dicho combustible y con signo positivo el incremento en la columna correspondiente al otro componente o mezcla.

Balance builder OLADE - IRES

Based on the annual questionnaire, following will be obtained:

- Management of calorific values of countries
- IRES energy balance reports
 - Aggregated
 - Disaggregated
- OLADE Energy Balance Report
- Greenhouse Gas Emissions Report with IPCC 2006 methodology
 - IRES Balance
 - OLADE Balance
- Information consistency analysis report



The screenshot displays a complex data table used for energy balance reporting. The table is organized into several main sections, each with a distinct header row. The top section includes columns for 'Sector', 'Sub-sector', 'Activity', 'Fuel', 'Energy', 'Value', 'Unit', 'Country', 'Year', and 'Value'. Below this, there are sections for 'Energy balance', 'Energy conversion', 'Energy transformation', and 'Energy distribution'. The table contains numerous rows of data, with some cells highlighted in yellow and others in grey, indicating different data points or categories. The interface is designed for detailed data entry and analysis of energy flows within a country or region.



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Thank you

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