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Energy Indicators for the Economic Dimension of Sustainable Development

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Mainstreaming Energy Sustainable Development Goals (SDGs), Targets and Indicators into Statistical Programmes in Select African Countries

Addis Ababa, Ethiopia, 27-29 June 2016

What are indicators?

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- Tools to analyse e.g. energy resources, production and use and renewable energy and energy efficiency trends.
- Based on detailed statistics of energy production/use and economic activity
- Each indicator addresses one aspect of energy
- Indicators need to be looked at in groups to understand the full picture
- Indicators need to be read in the context of each country's economy and resources
- Indicators have proper applications and limitations
- Can inform policy decisions, help gauge policy effectiveness and unintended consequences

The indicators pyramid

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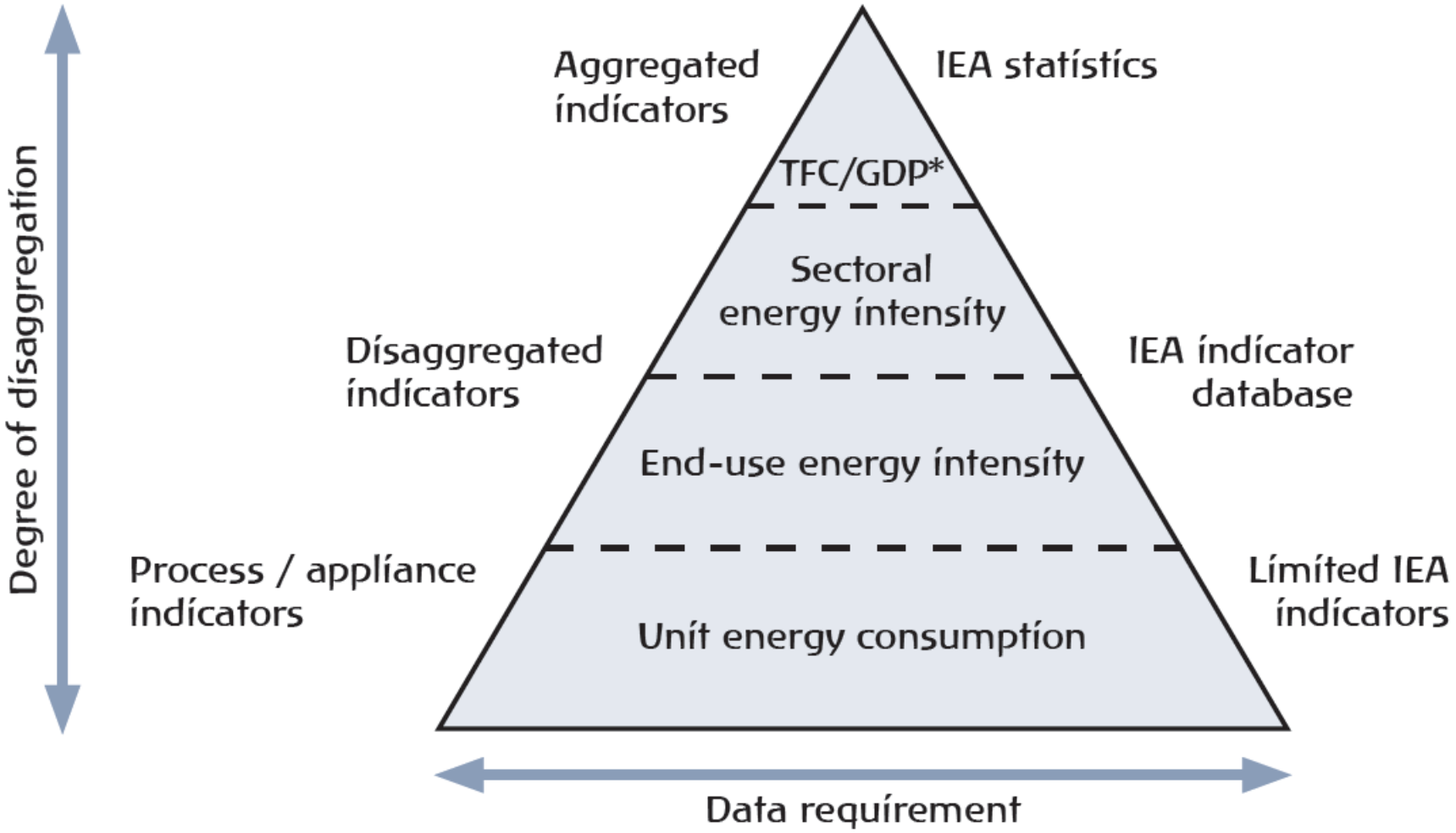

Source: International Energy Agency (2014) Energy Efficiency Indicators: Fundamentals on Statistics, OECD/IEA.

IEA end-use coverage for indicators

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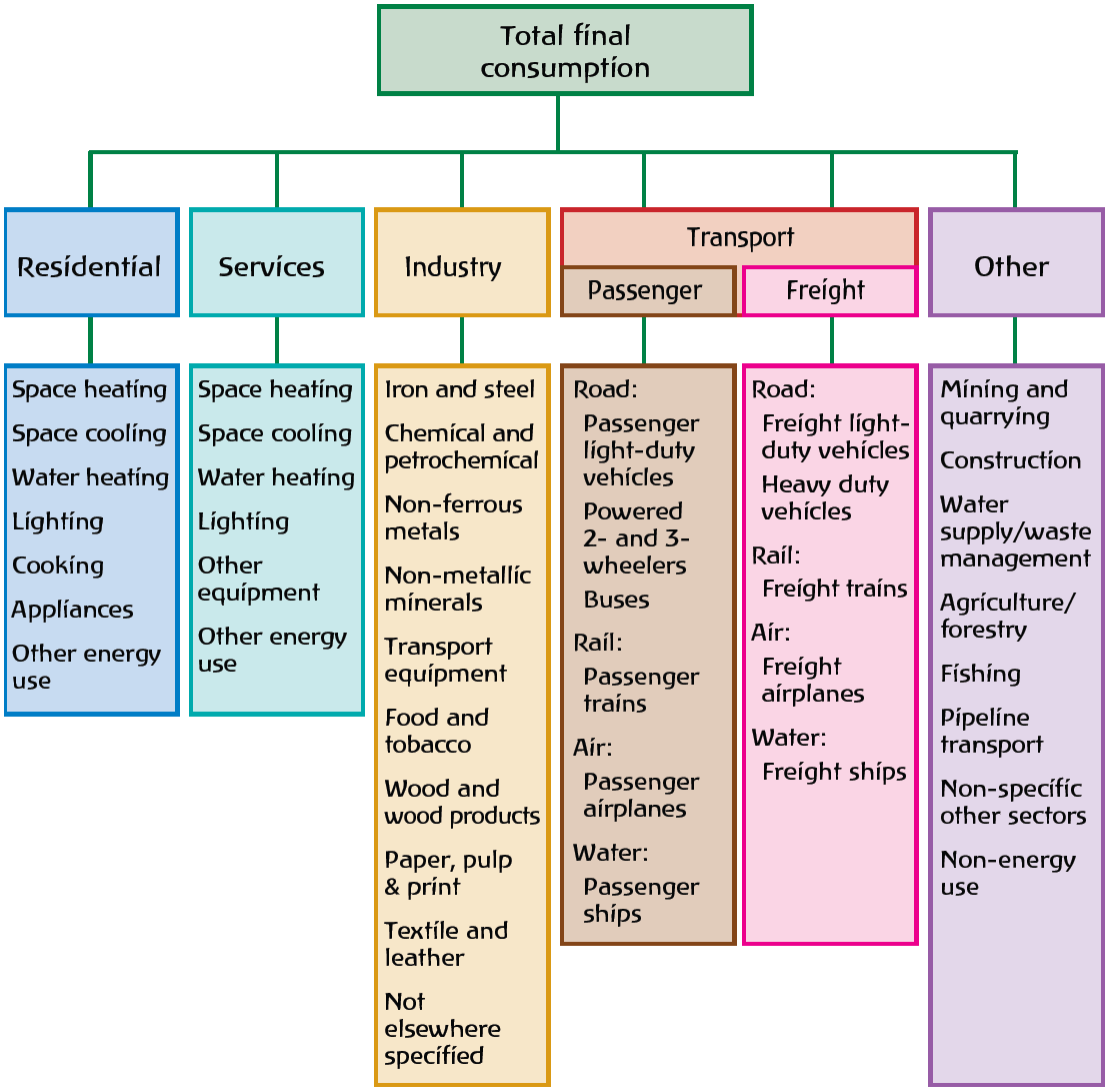

Source: International Energy Agency (2014) Energy Efficiency Indicators: Fundamentals on Statistics, OECD/IEA.

EEA DPSIR framework

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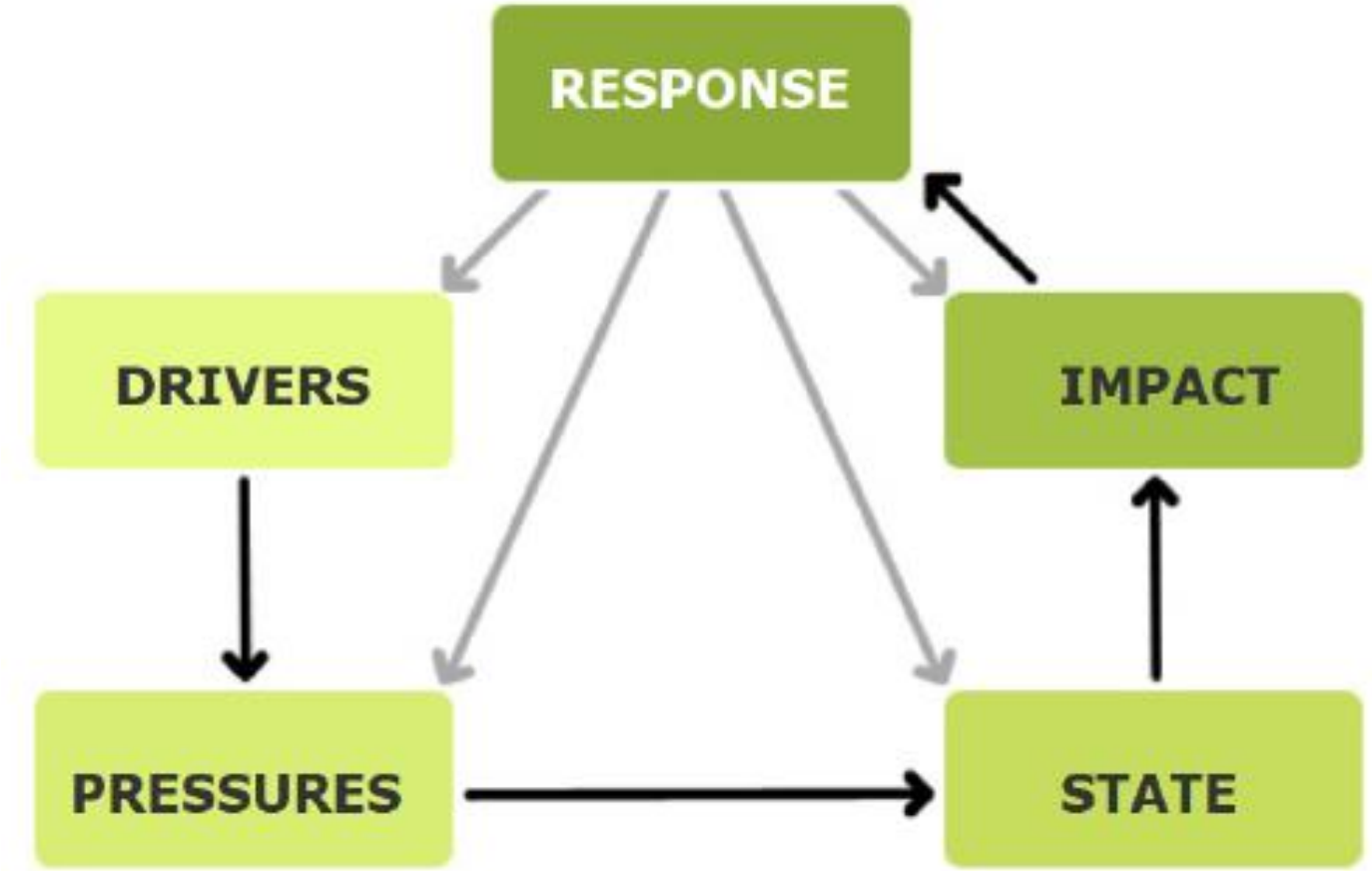

Source: European Environment Agency

The UN EISD initiative

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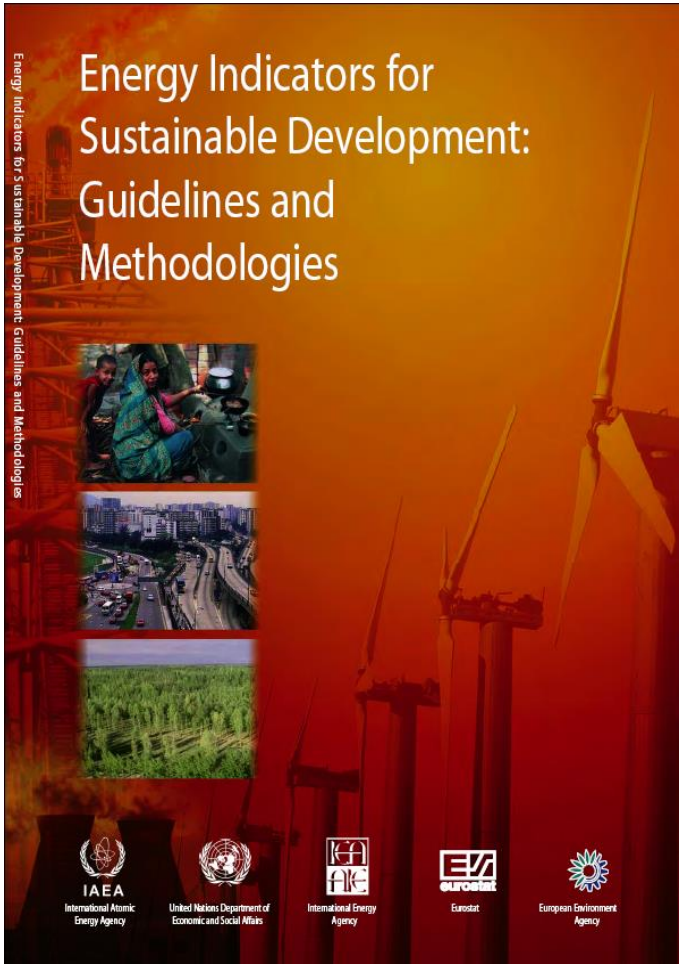
- Work started by the UN in 1995.
- 5 agencies involved: UNDESA, OECD/IEA, IAEA, Eurostat, EEA.
- Initial project with 7 countries: Brazil, Cuba, Lithuania, Mexico, Russia, Slovakia, Thailand.
- Report on guidelines and methodologies published in 2005.



Economic Dimension of Sustainable Development

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- Modern economies depend on a reliable and adequate energy supply.
- All sectors of the economy — residential, commercial, transport, service and agriculture — demand modern energy services.
- These services in turn foster economic and social development at the local level by raising productivity and enabling local income generation.
- Energy supply affects jobs, productivity and development.
- Electricity is the dominant form of energy for communications, information technology, manufacturing and services.

Economic indicators and themes

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The economic indicators have two themes. Divided into a number of sub-themes:

1. **Use and production patterns**

Overall Use, Overall Productivity, Supply Efficiency, Production, End Use, Diversification (Fuel Mix) and Prices.

2. **Security**

Imports and Strategic Fuel Stocks.

Use and production patterns (1)

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Overall Use

ECO1 Energy use per capita

– Energy use (total primary energy supply, total final consumption and electricity use)

– Total population

Overall Productivity

ECO2 Energy use per unit of GDP

– Energy use (total primary energy supply, total final consumption and electricity use)

– GDP

Overall use and productivity

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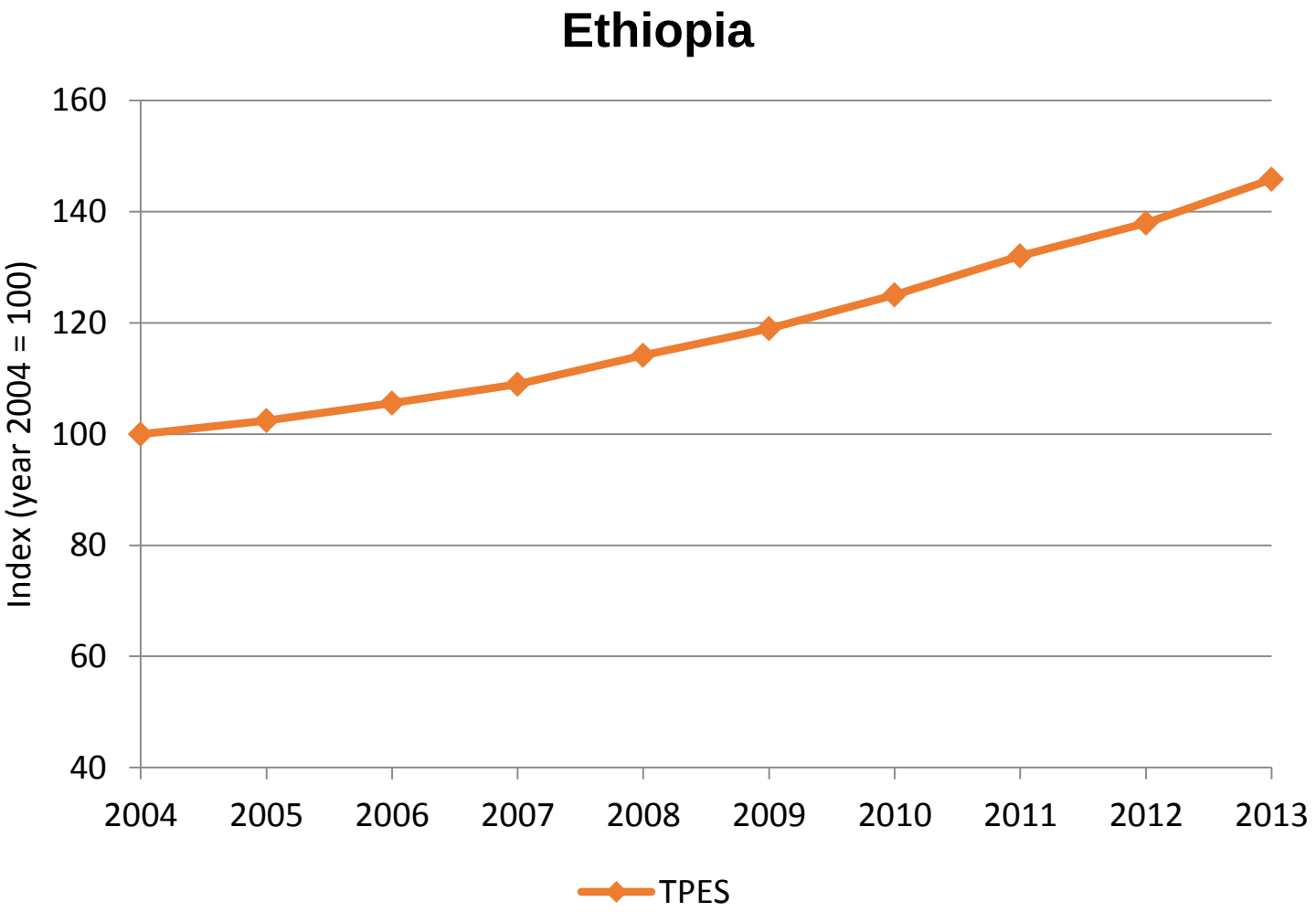

Data taken from International Energy Agency, 2015, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 17 June 2016, SN: 6301

Overall use:
ECO1 - TPES per capita

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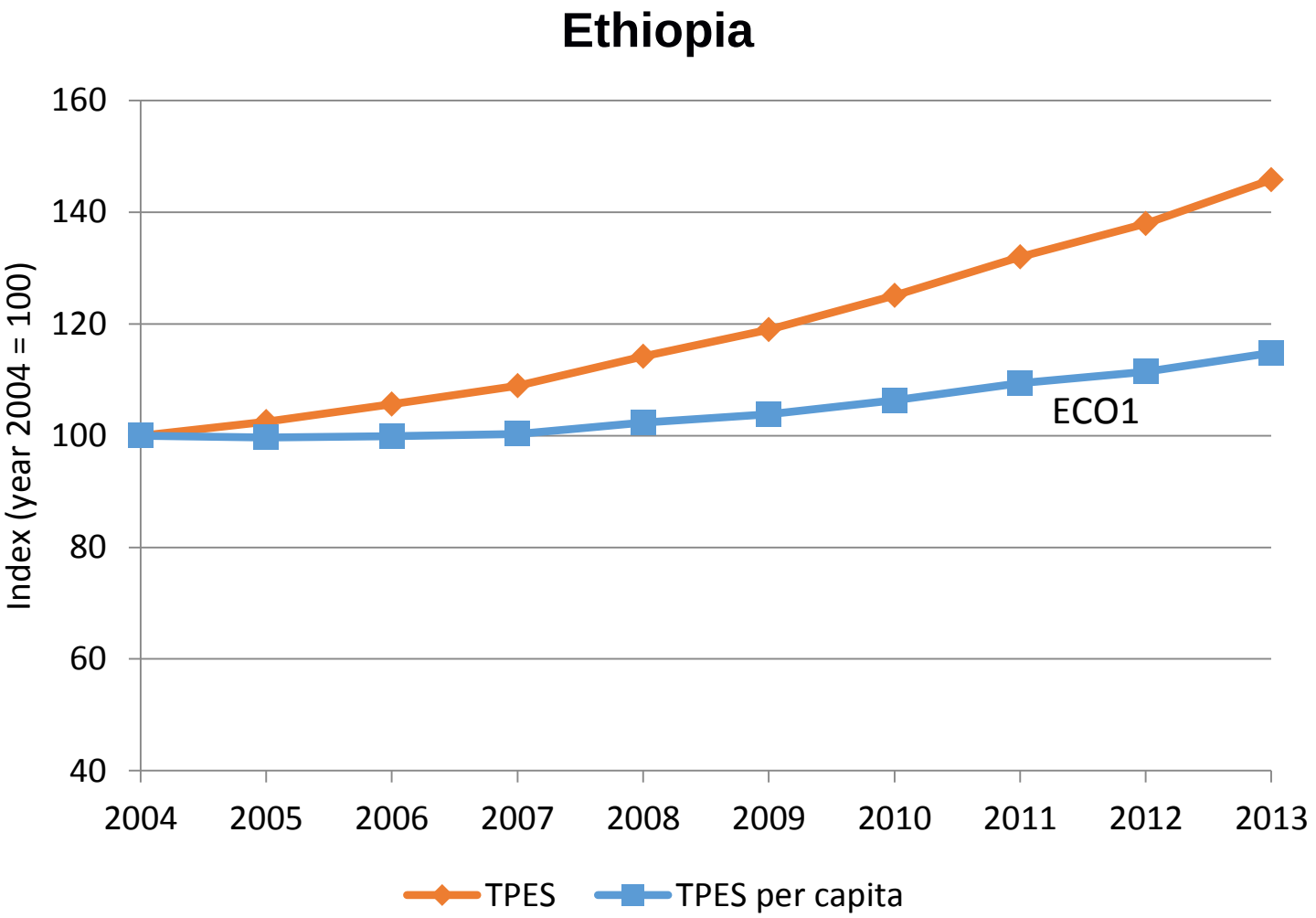

Data taken from International Energy Agency, 2015, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 17 June 2016, SN: 6301

Overall productivity: ECO2 – TPES per unit of GDP

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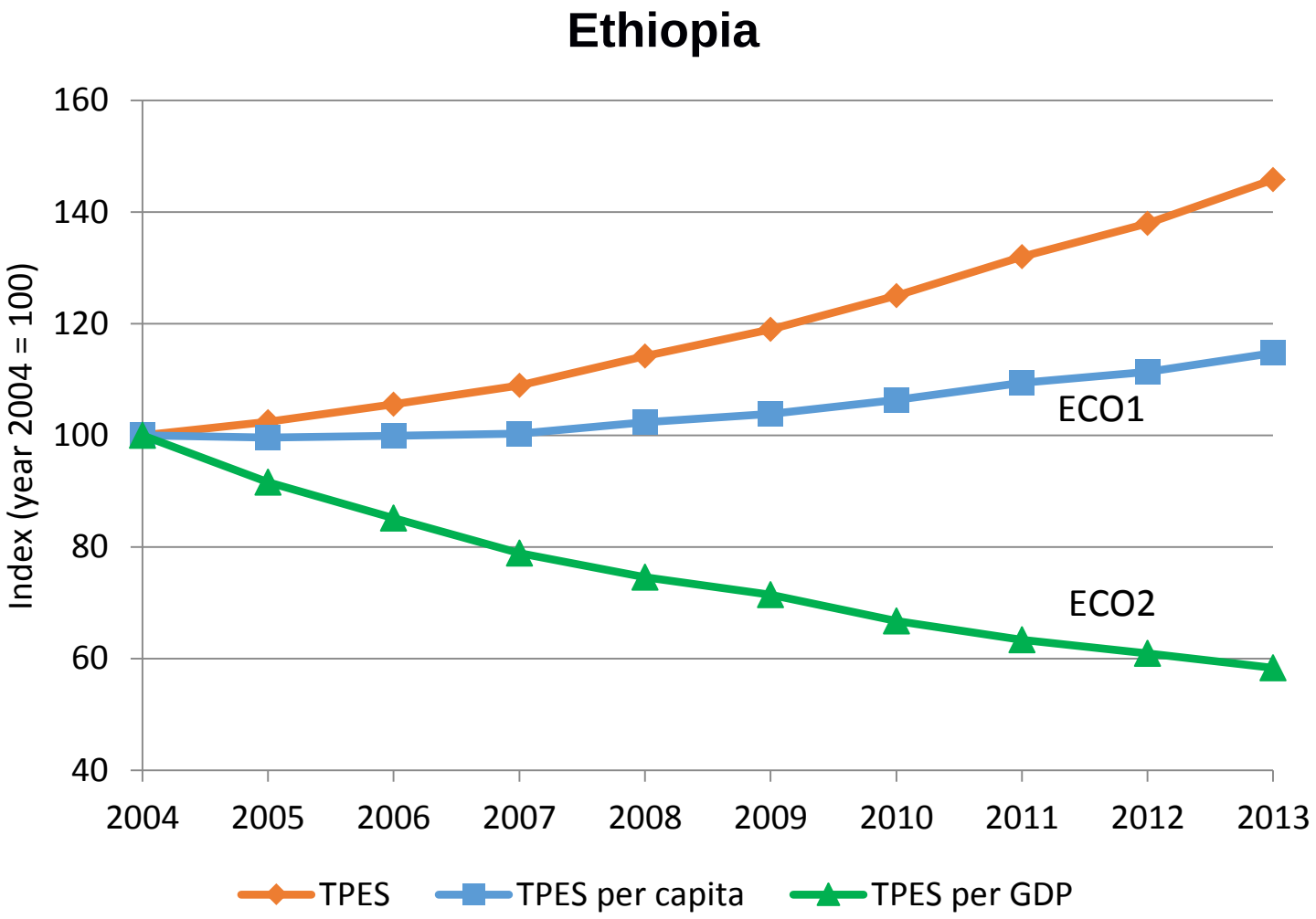

Data taken from International Energy Agency, 2015, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 17 June 2016, SN: 6301

Use and production patterns (2)

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Supply Efficiency

ECO3 Efficiency of energy conversion and distribution

– Losses in transformation systems including losses in electricity generation, transmission and distribution

Supply efficiency: ECO3 - Efficiency of energy supply

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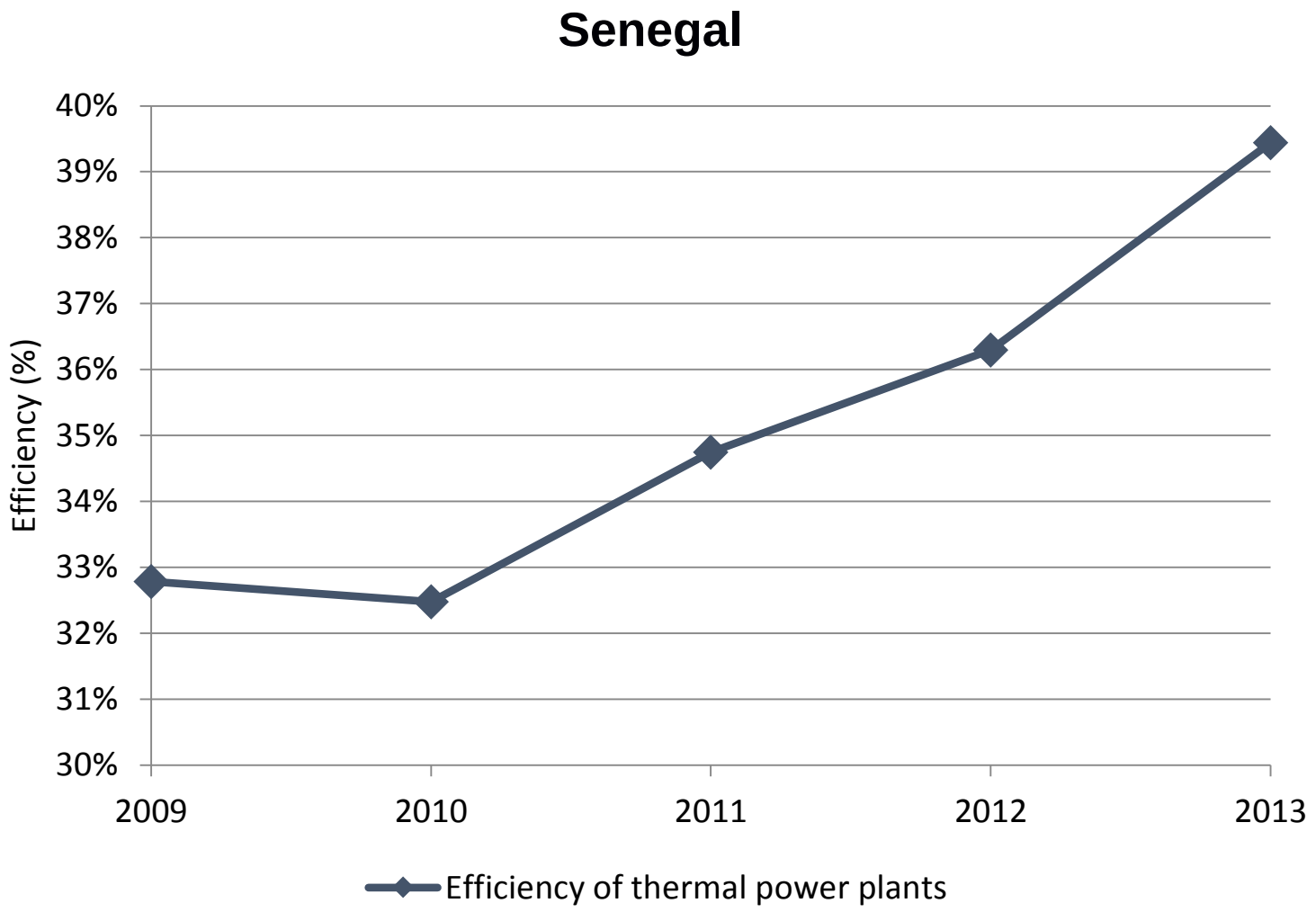

Data taken from WEC: www.worldenergy.org/data/efficiency-indicators

Supply efficiency: ECO3 - Efficiency of energy distribution

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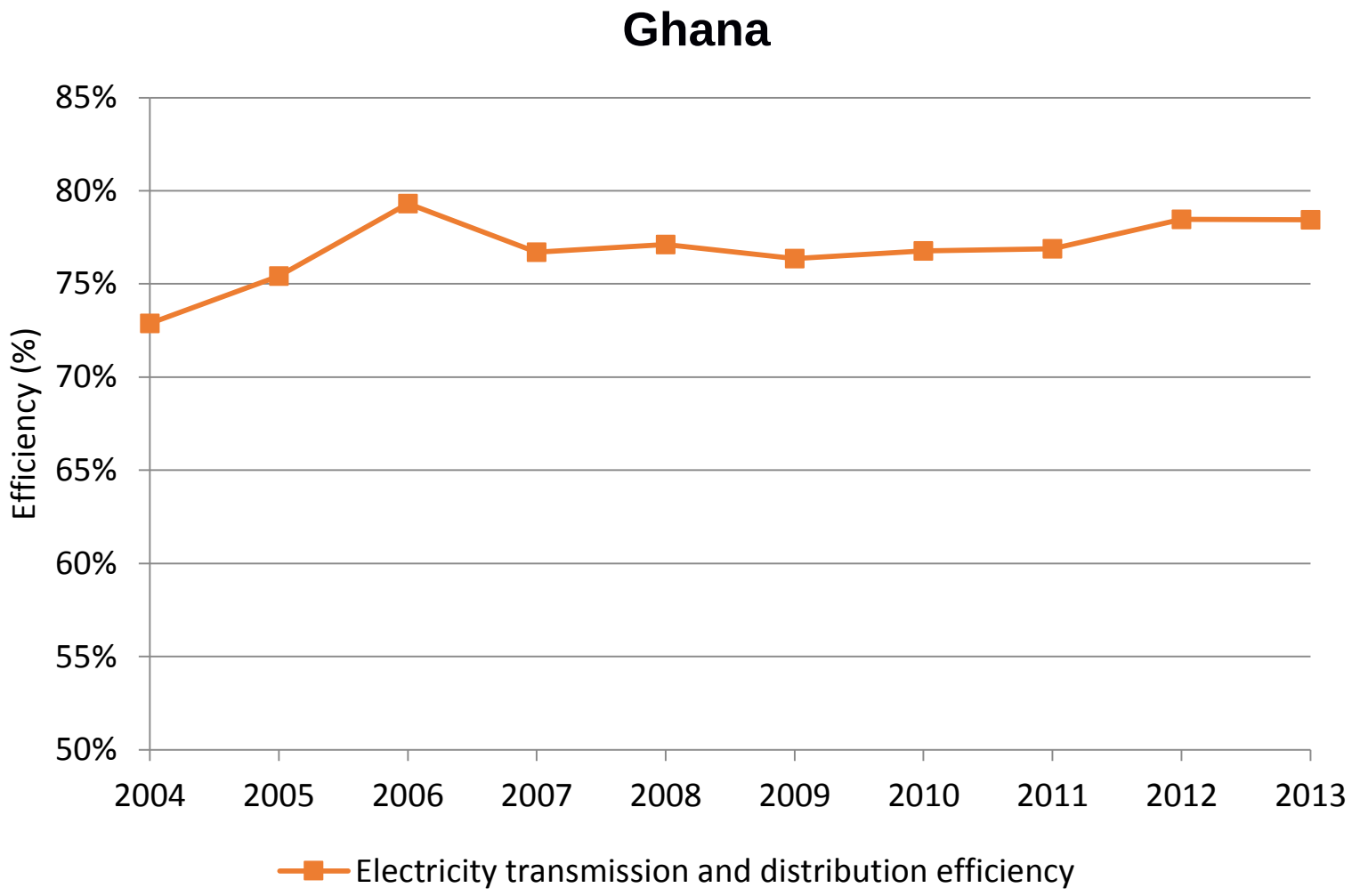

Data taken from International Energy Agency, 2015, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 17 June 2016, SN: 6301

Use and production patterns (3)

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Production

ECO4 Reserves-to-production ratio

– Proven recoverable reserves

– Total energy production

ECO5 Resources-to-production ratio

– Total estimated resources

– Total energy production

Production: ECO4 - Reserves to production ratio

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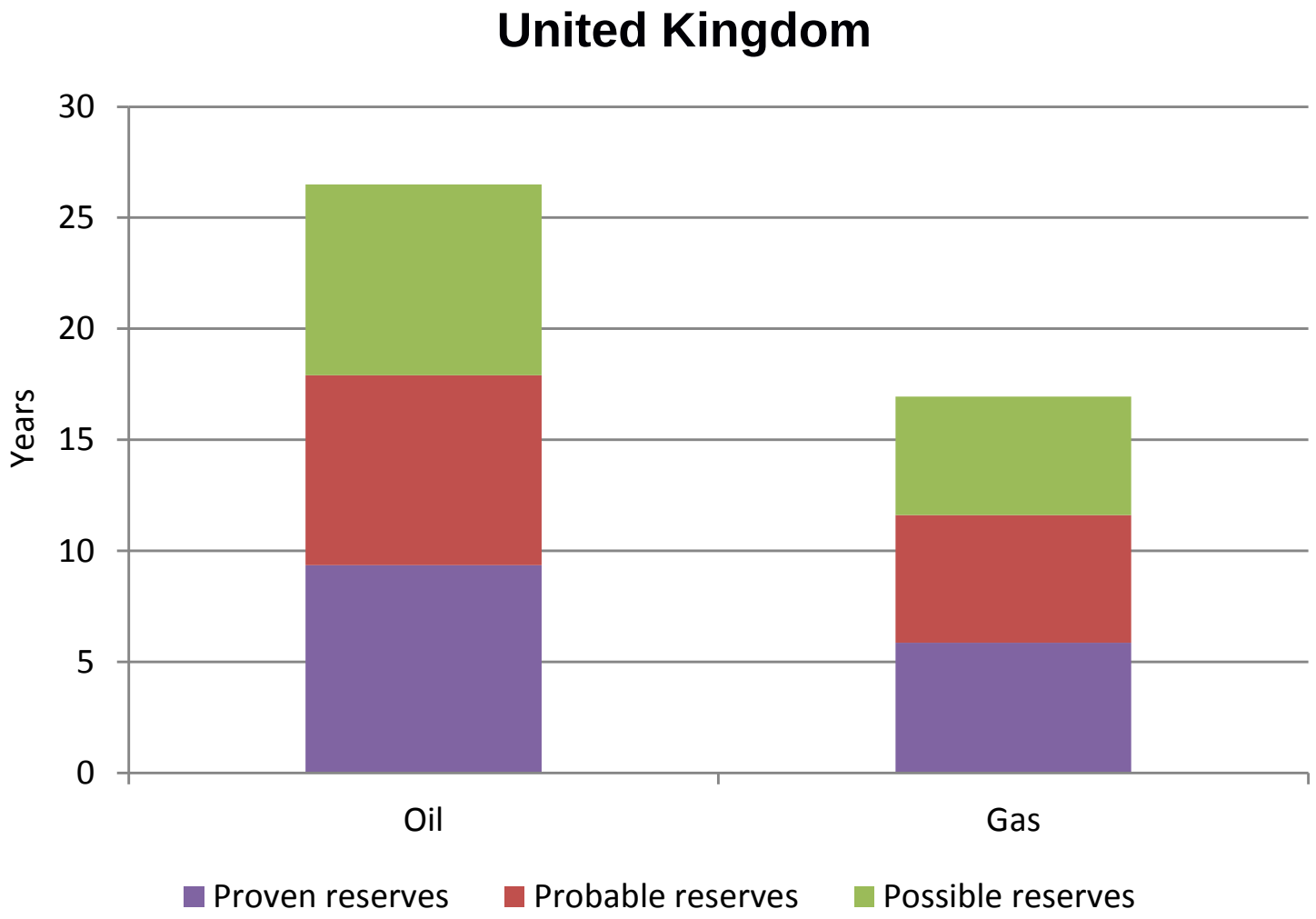

Data taken from DECC: www.gov.uk/government/uploads/system/uploads/attachment_data/file/441395/Appendix_2_Historic_UK_Oil_and_Gas_Reserves_and_Production_2015.pdf

Use and production patterns (4)

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End Use

ECO6 Industrial energy intensities

ECO7 Agricultural energy intensities

ECO8 Service/ commercial energy intensities

– Energy use in industrial or commercial or agricultural sector

– Corresponding value added

End Use: ECO6 & ECO8 – Industrial and services energy intensities

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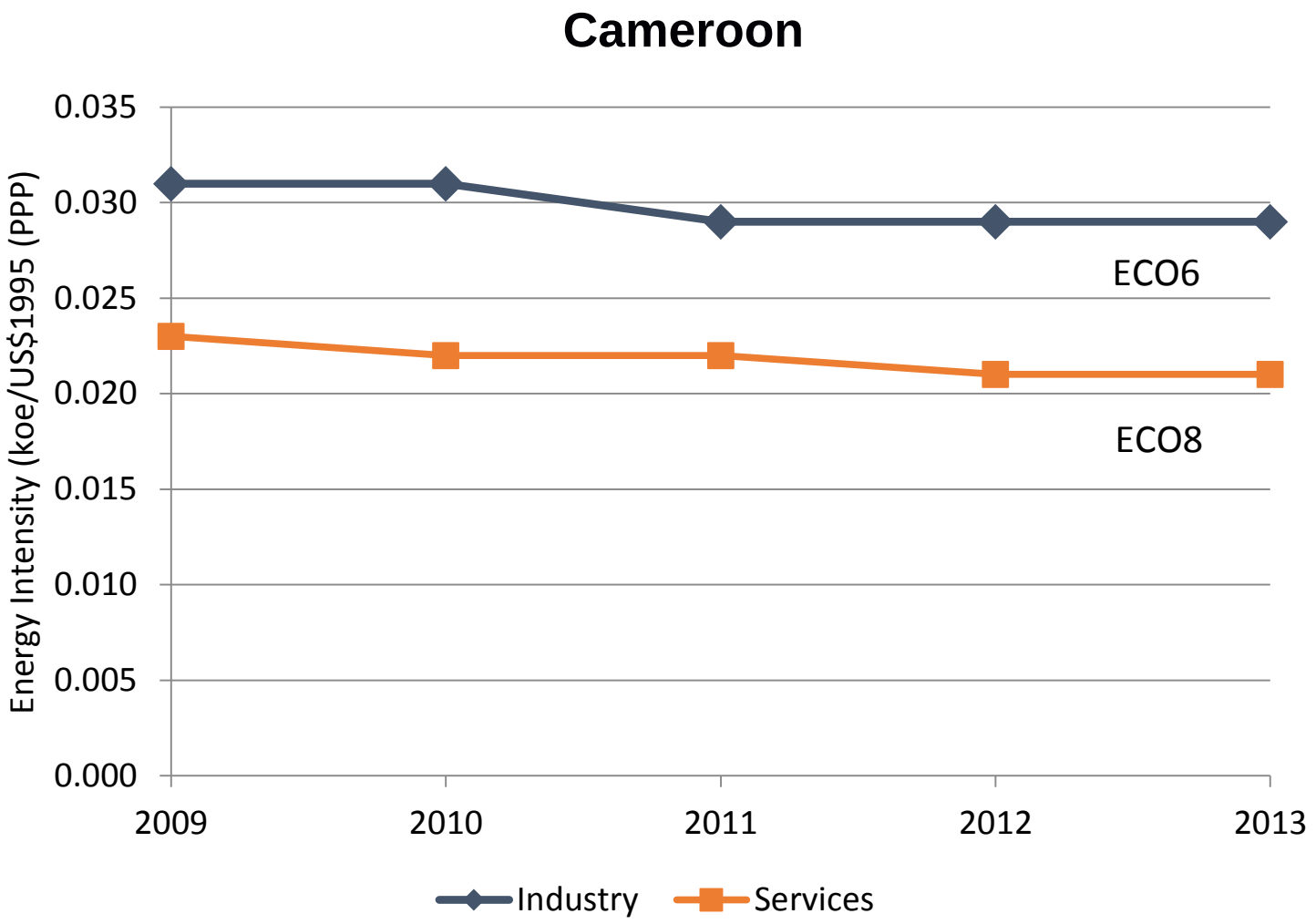

Data taken from WEC:www.worldenergy.org/data/efficiency-indicators/

Use and production patterns (5)

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End Use (cont.)

ECO9 Household energy intensities

– Energy use in households and by key end use

– Number of households, floor area, persons per household, appliance ownership

ECO10 Transport energy intensities

– Energy use in passenger travel and freight sectors and by mode

– Passenger-km travel and tonne-km freight and by mode

End use: ECO9 – Household energy intensity

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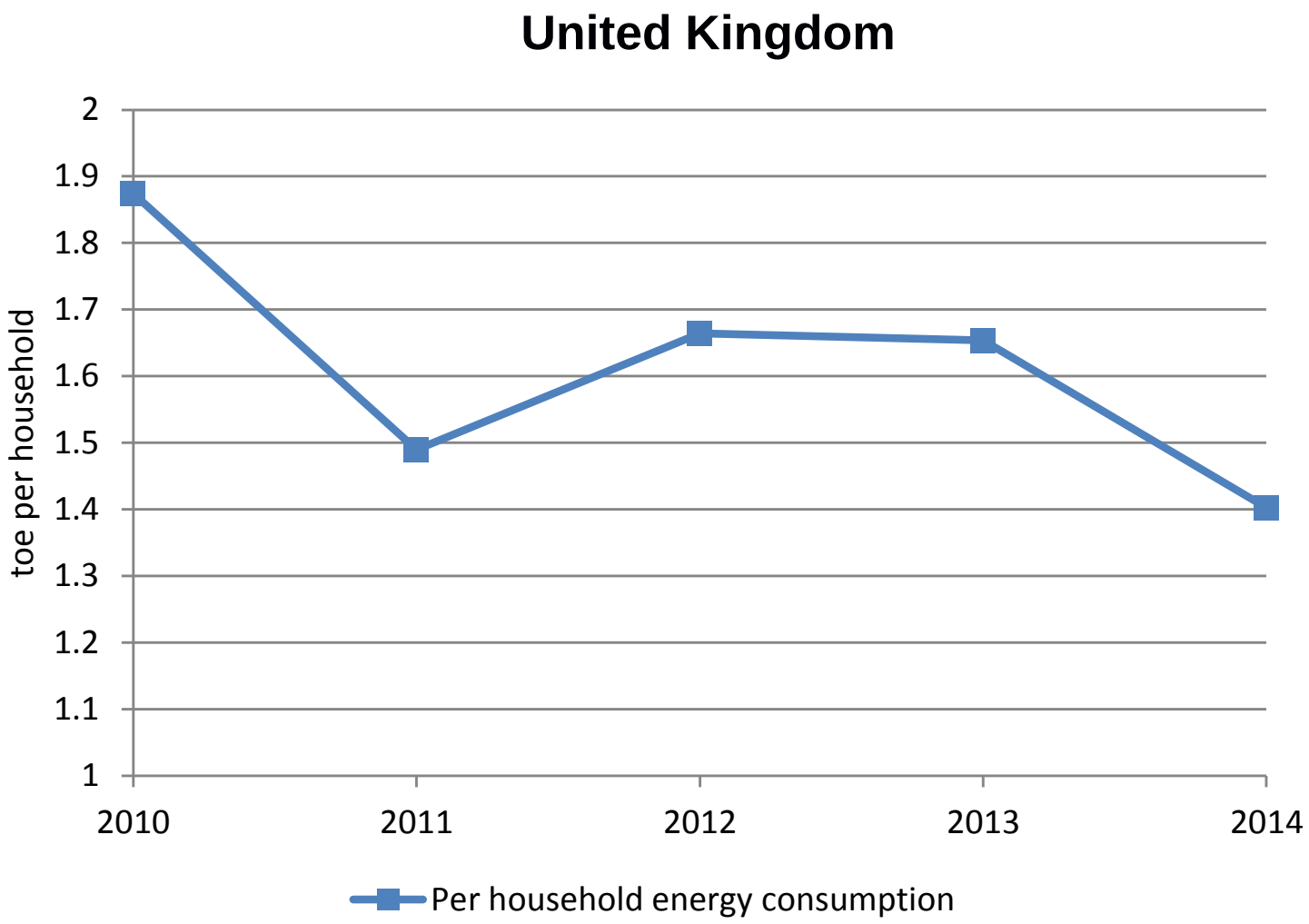

Data taken from Department of Energy and Climate Change (2015) Energy consumption in the UK

End use: ECO10 – Transport energy intensities

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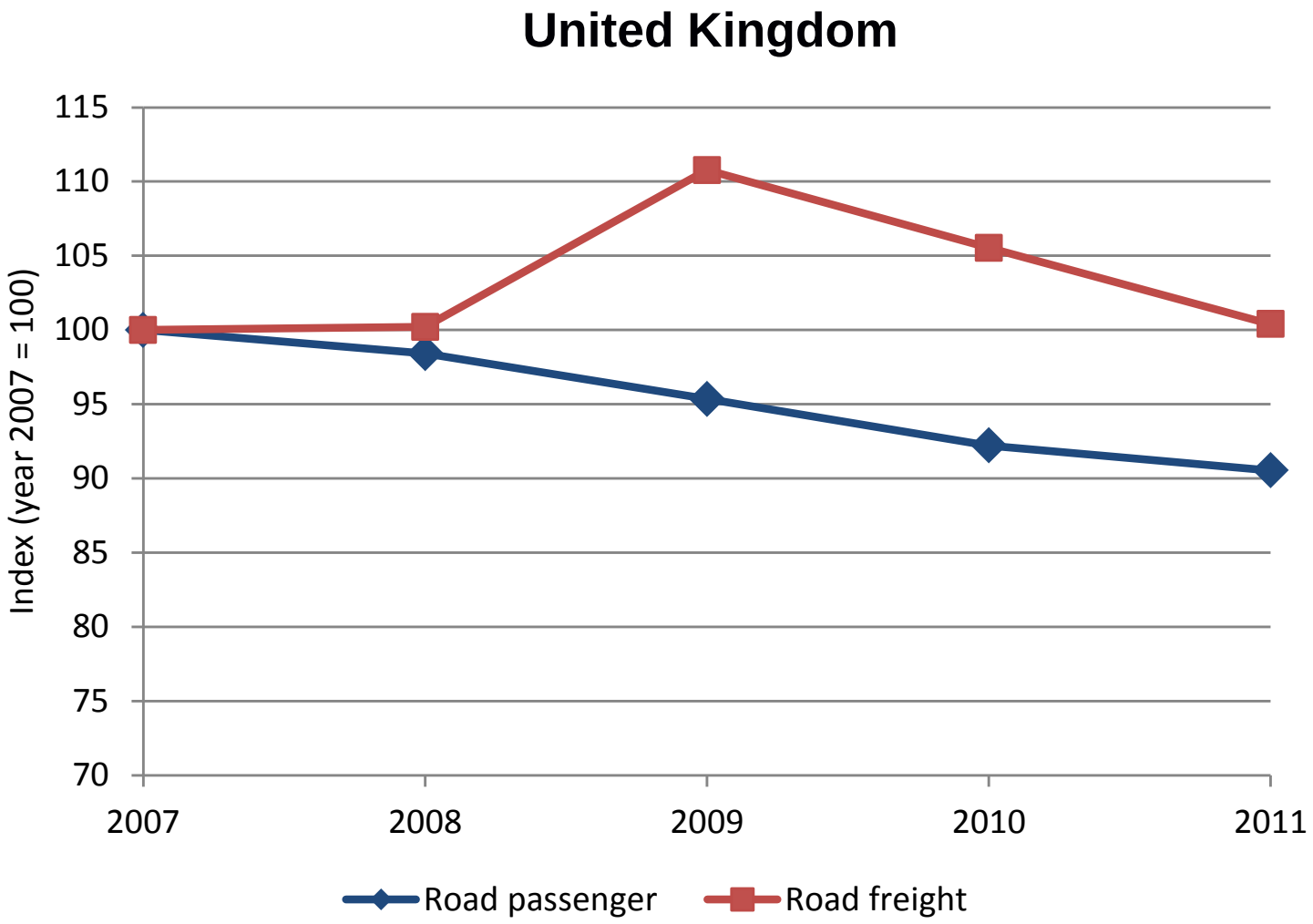

Data taken from Department of Energy and Climate Change (2015) Energy consumption in the UK

Use and production patterns (6)

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ECO11 Fuel shares in energy and electricity

– Primary energy supply and final consumption, electricity generation and generating capacity by fuel type

– Total primary energy supply, total final consumption, total electricity generation and total generating capacity

Diversification:
ECO11 – Fuel shares in TPES

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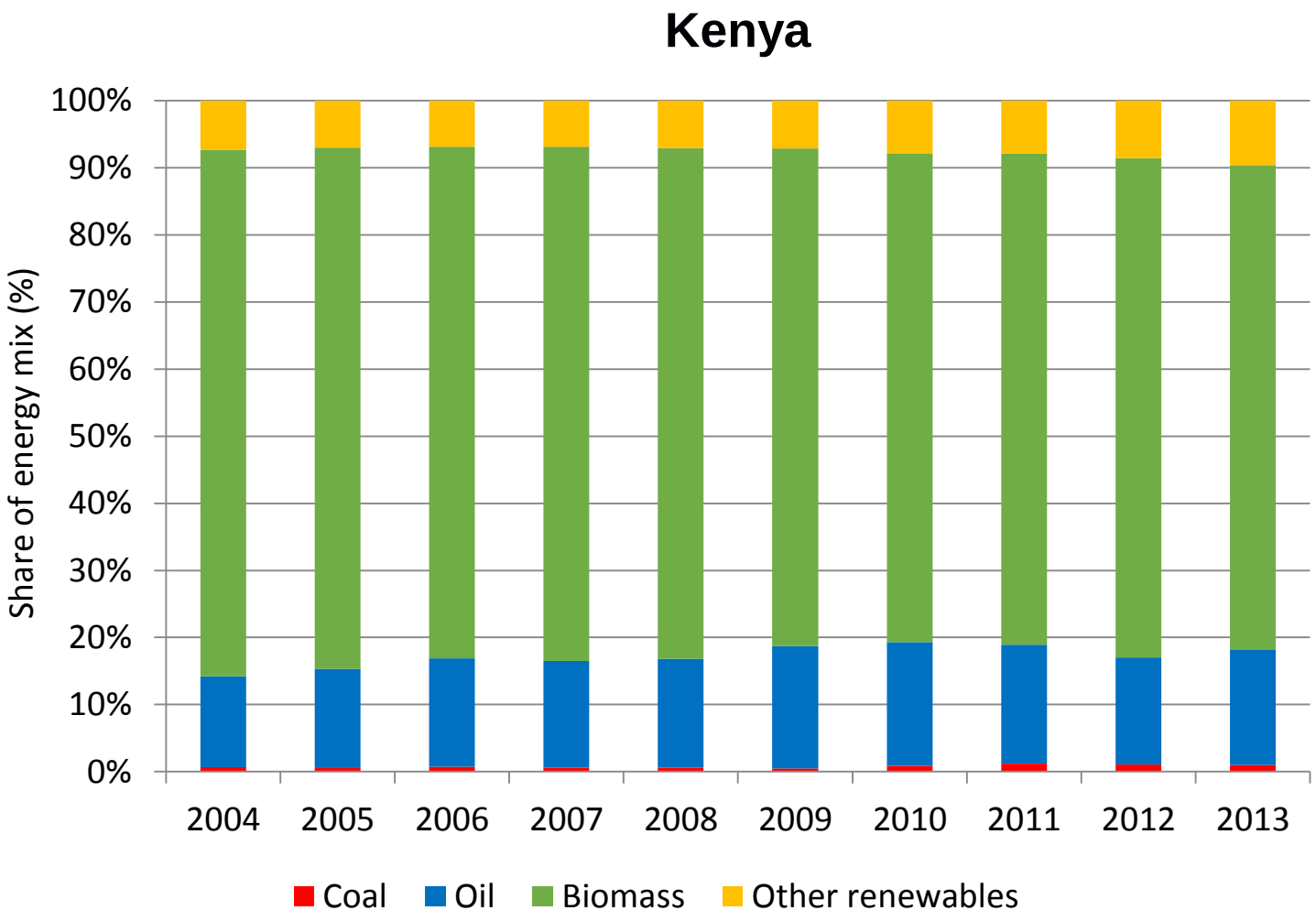

Data taken from International Energy Agency, 2015, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 17 June 2016, SN: 6301

Diversification: ECO11 – Fuel shares in final consumption

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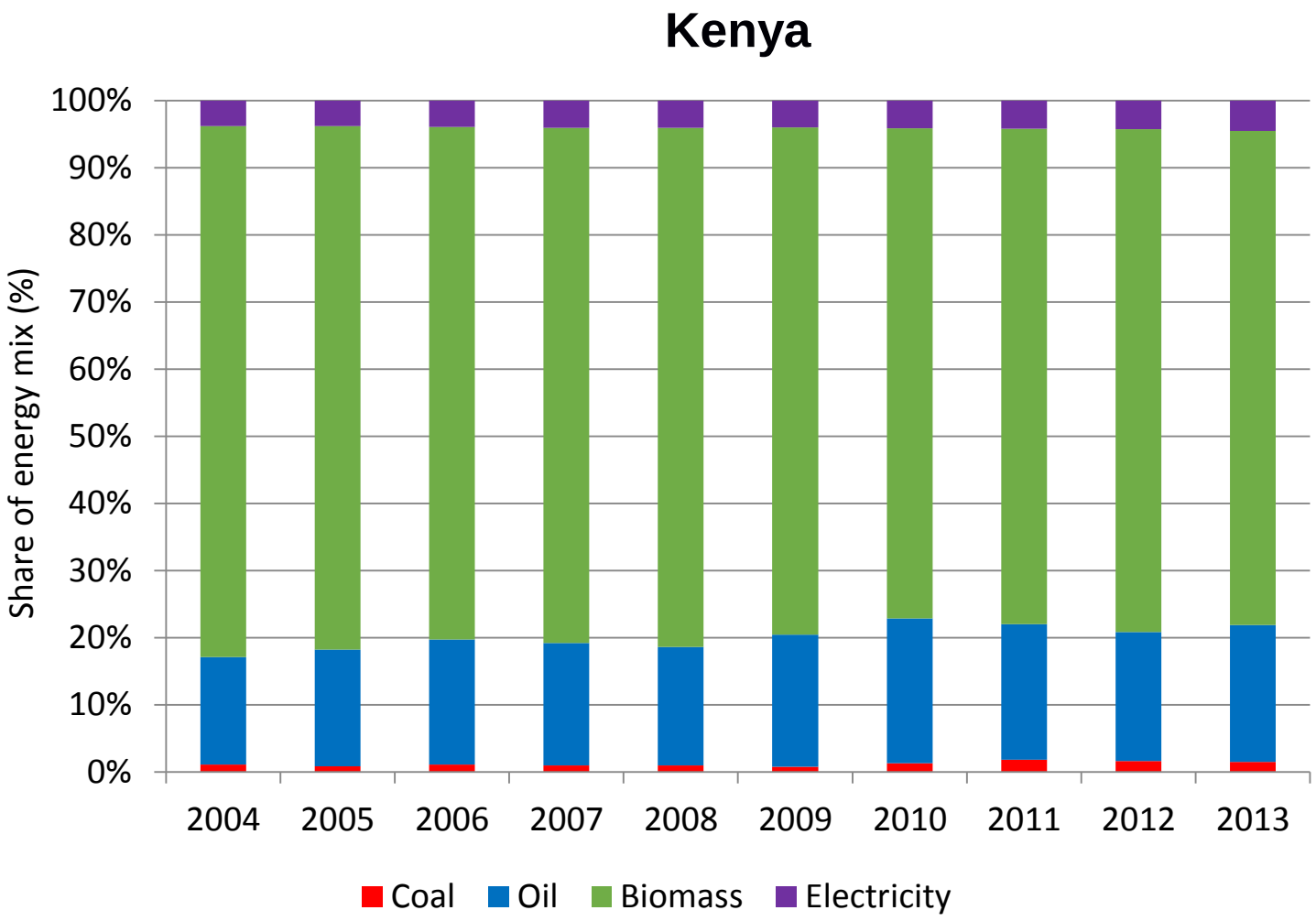

Data taken from International Energy Agency, 2015, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 17 June 2016, SN: 6301

Use and production patterns (7)

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ECO12 Non-carbon energy share in energy and electricity

– Primary supply, electricity generation and generating capacity by non-carbon energy

– Total primary energy supply, total electricity generation and total generating capacity

ECO13 Renewable energy share in energy and electricity

– Primary energy supply, final consumption and electricity generation and generating capacity by renewable energy

– Total primary energy supply, total final consumption, total electricity generation and total generating capacity

Diversification: ECO12 – Non-carbon energy share in electricity

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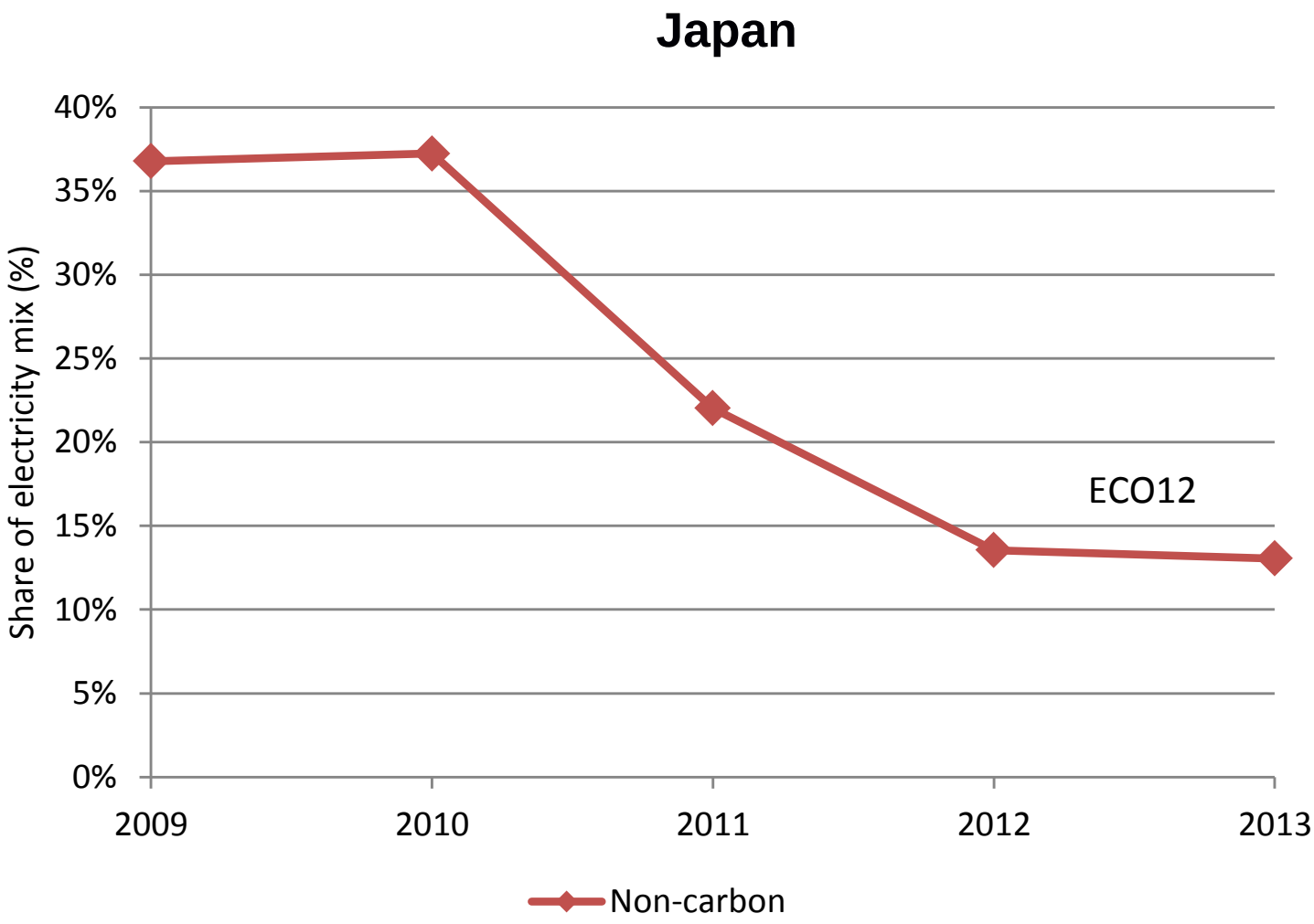

Data taken from International Energy Agency, 2014, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 02 November 2015, SN: 6301

Diversification: ECO13 – Renewable energy share in electricity

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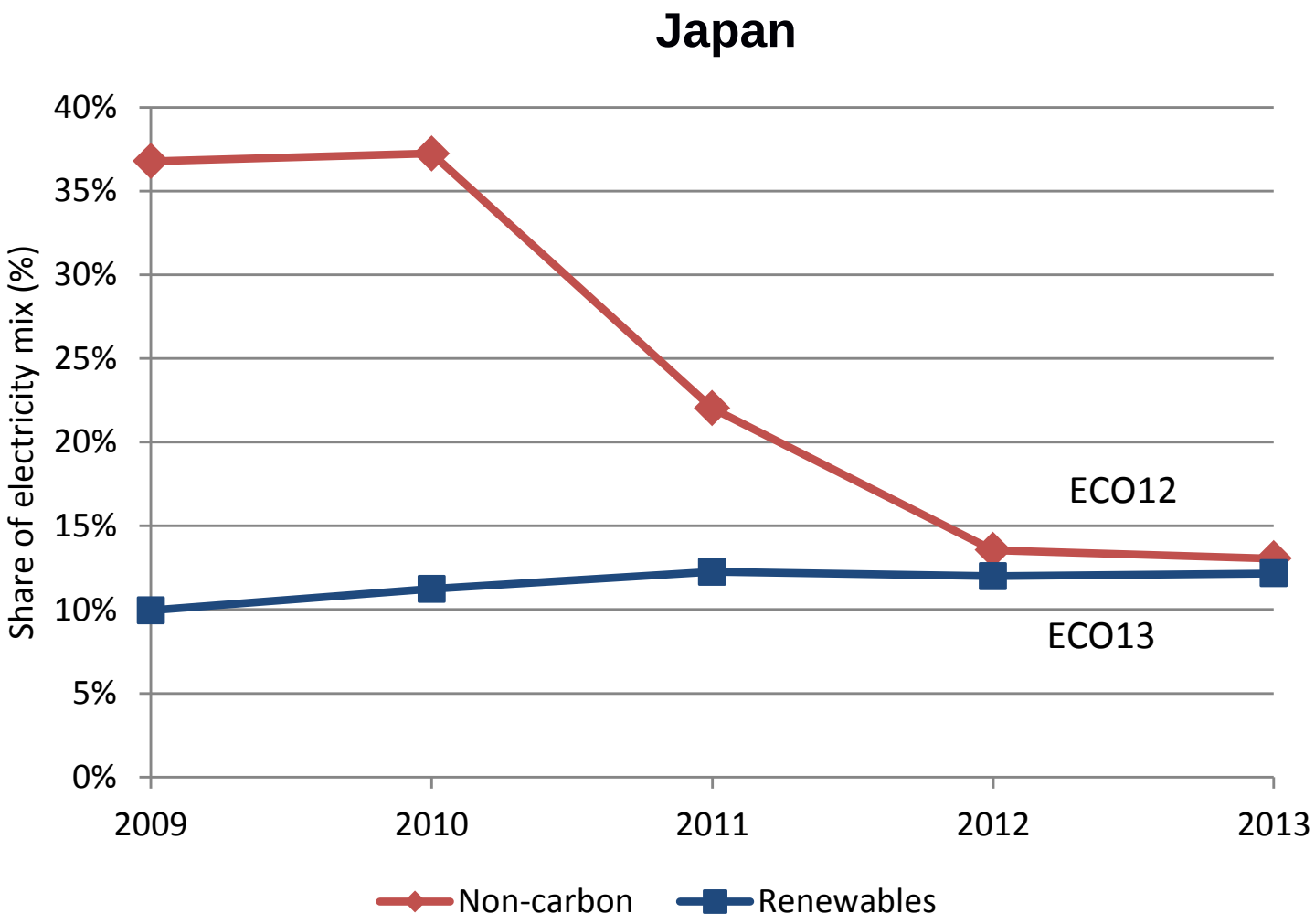

Data taken from International Energy Agency, 2014, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 02 November 2015, SN: 6301

Use and production patterns (8)

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Prices

ECO14 End-use energy prices by fuel and by sector

– Energy prices (with and without tax/subsidy)

Use and production patterns: ECO14 - End use energy prices

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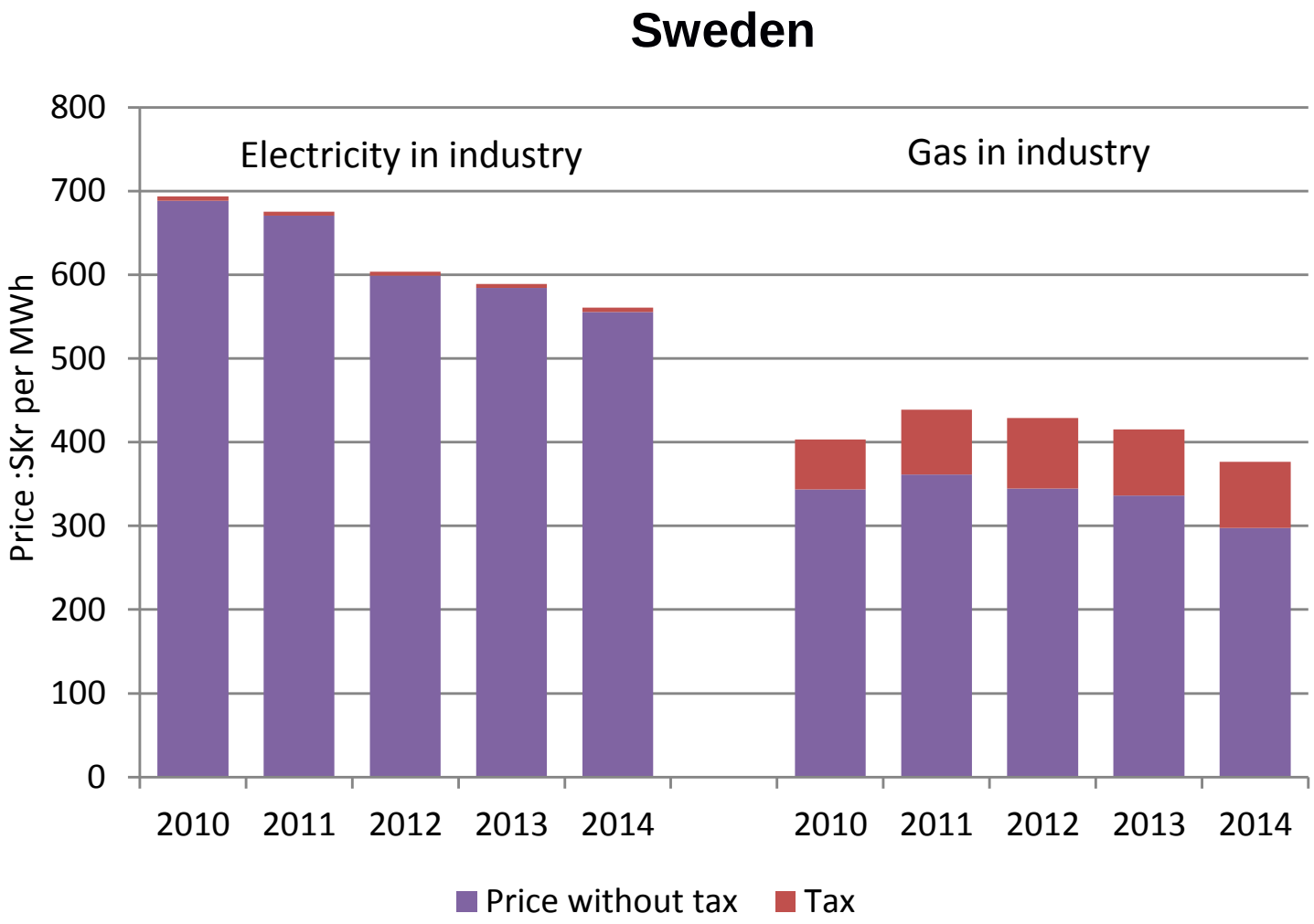

Data taken from International Energy Agency, 2014, *Energy Prices and Taxes*, [data collection], UK Data Service, *6th Edition,* Accessed 13 November 2015, SN: 6301

Security

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Imports

ECO15 Net energy import dependency

– Energy imports

– Total primary energy supply

Strategic Fuel Stocks

ECO16 Stocks of critical fuels per corresponding fuel consumption

– Stocks of critical fuel (e.g. oil, gas, etc.)

– Critical fuel consumption

Imports: ECO15 - Net energy import dependency

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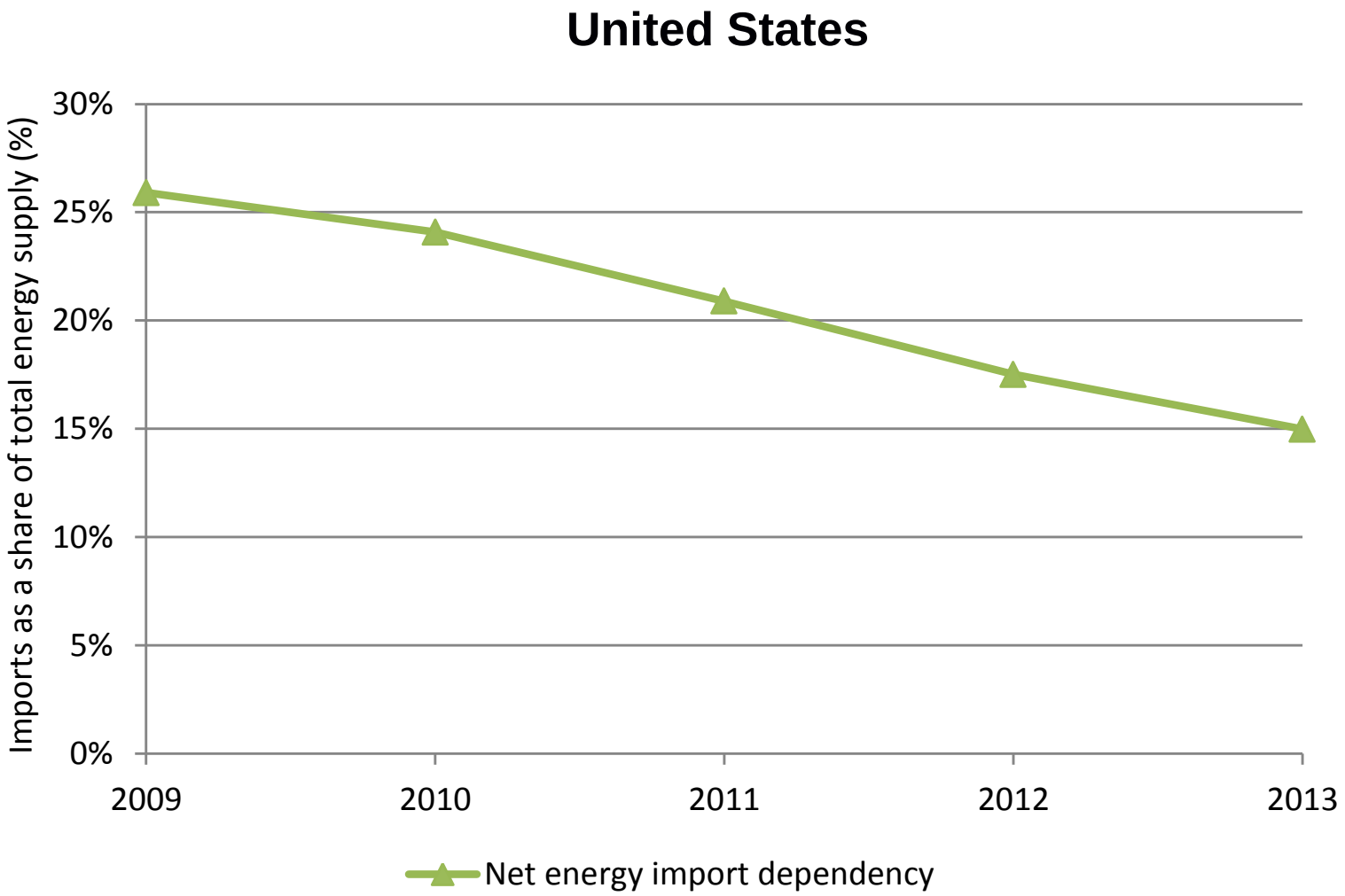

Data taken from International Energy Agency, 2014, *International Energy Agency World Energy Balances, 1960-2013*, [data collection], UK Data Service, *6th Edition,* Accessed 02 November 2015, SN: 6301

Strategic fuel stocks: ECO16 - Stocks of critical fuels

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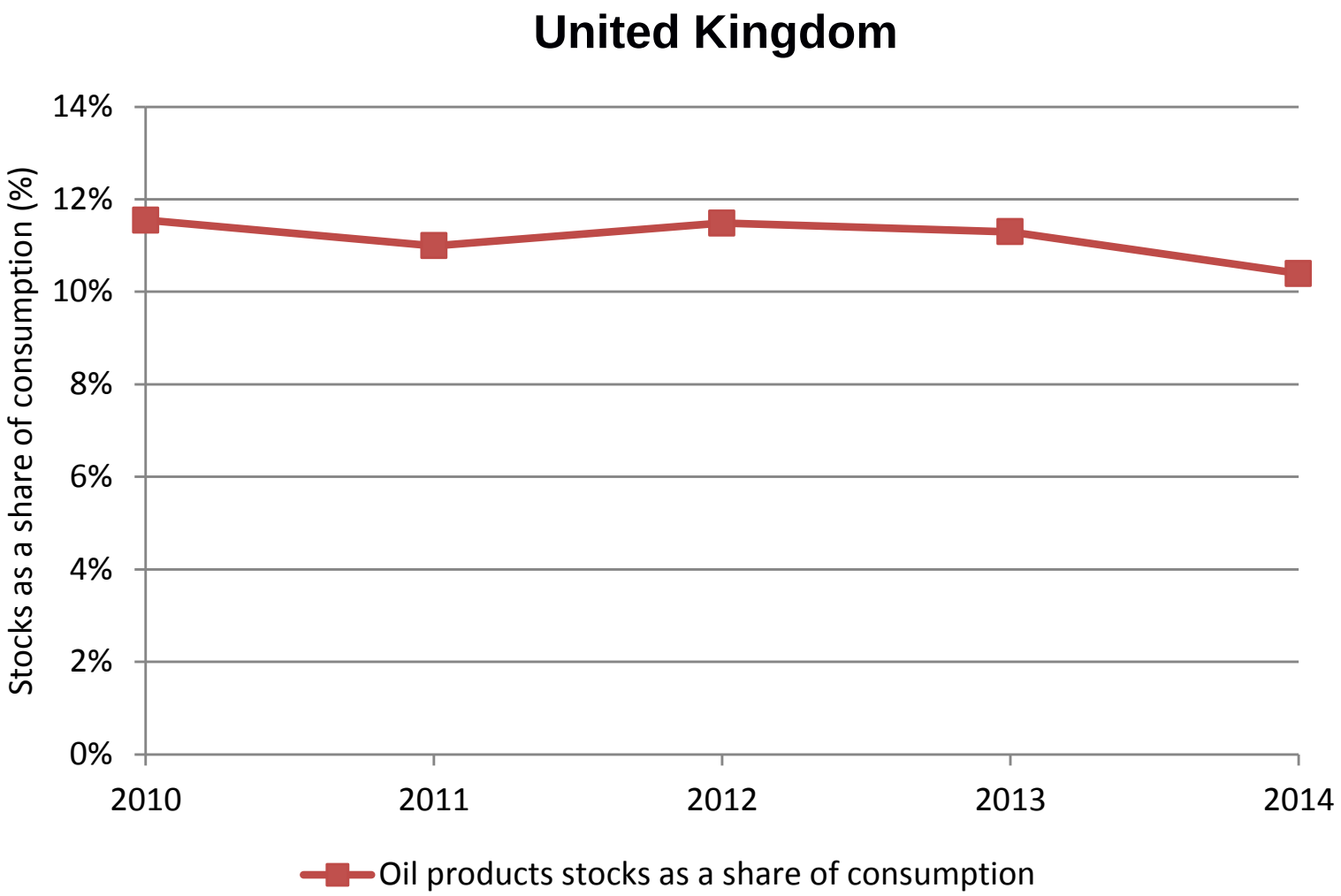

Data taken from Department of Energy and Climate Change (2015) Digest of UK Energy Statistics (DUKES).

Final remarks

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- Energy indicators covering the economic dimension should be used together with those examining the social and environmental dimensions.
- Unlike some other indicators, the EISD are meant to be used for national analyses.
- Not all indicators will be appropriate for all countries.
- Not all countries will currently have the data to construct all indicators.
- They are intended to help countries address their energy challenges in the most appropriate way.