

A map of the Caribbean region with various islands and countries highlighted in different colors. A large, dark grey rectangular box is overlaid in the center, containing the title text in white. The map shows the following labeled locations: THE BAHAMAS (pink), CUBA (dark green), CAYMAN ISLANDS (light green), JAMAICA (red), HAITI (purple), DOMINICAN REPUBLIC (blue), PUERTO RICO (yellow), VIRGIN ISLANDS (light blue), ANGUILLA (light blue), SAINT MARTIN (light blue), ST BARTS (light blue), BARBUDA (light blue), ANTIGUA (light blue), GUADELOUPE (light blue), DOMINICA (red), MARTINIQUE (blue), ST LUCIA (red), ST VINCENT (red), THE GRENADINES (red), GRENADA (red), ARUBA (light blue), CURACAO (light blue), BONAIRE (light blue), BARBADOS (light blue), TOBAGO (light blue), and TRINIDAD (red).

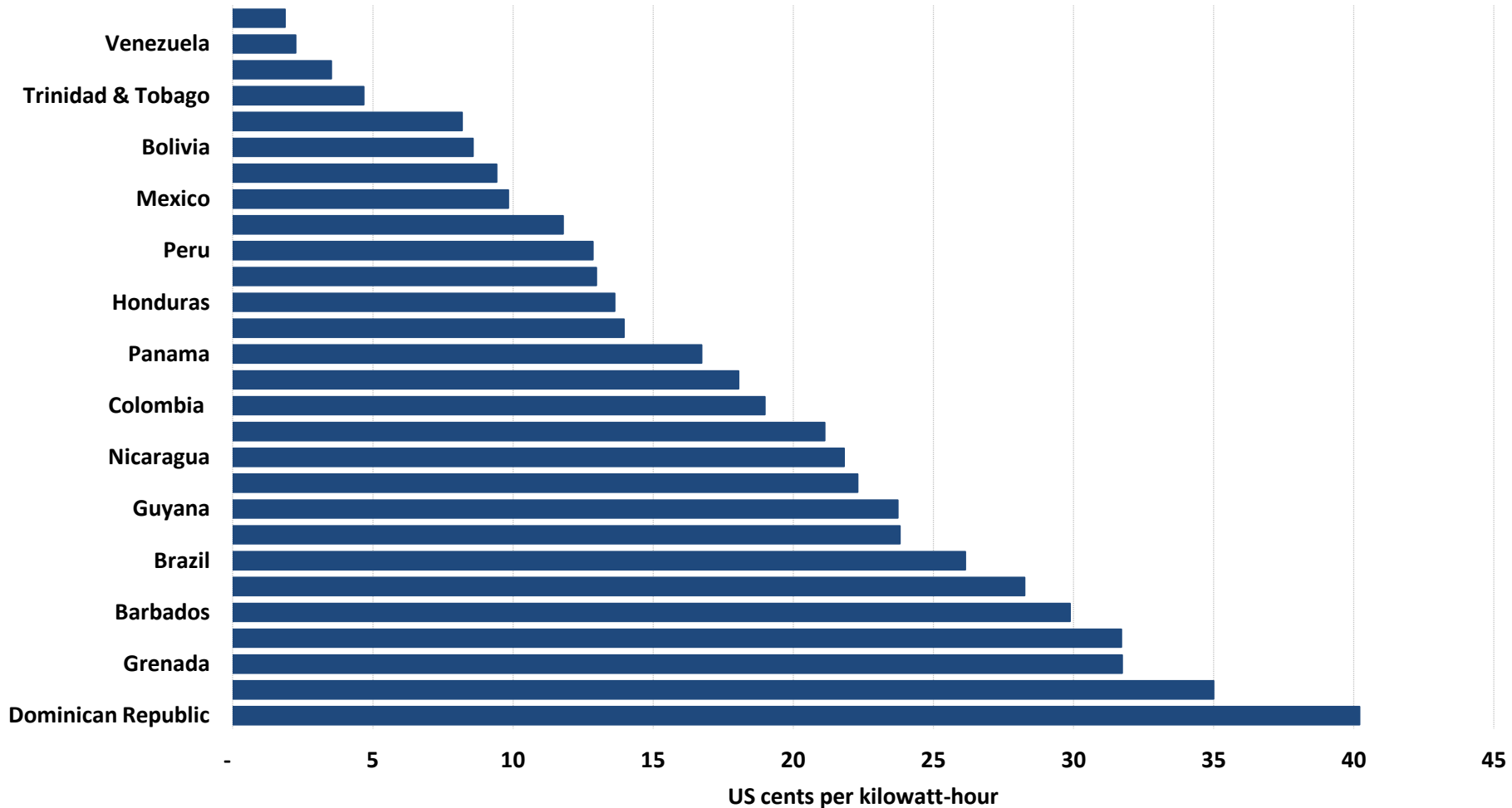
Improving Energy Efficiency & Lowering Costs in the Caribbean

Ramón Espinasa, Lead Specialist (Oil & Gas)

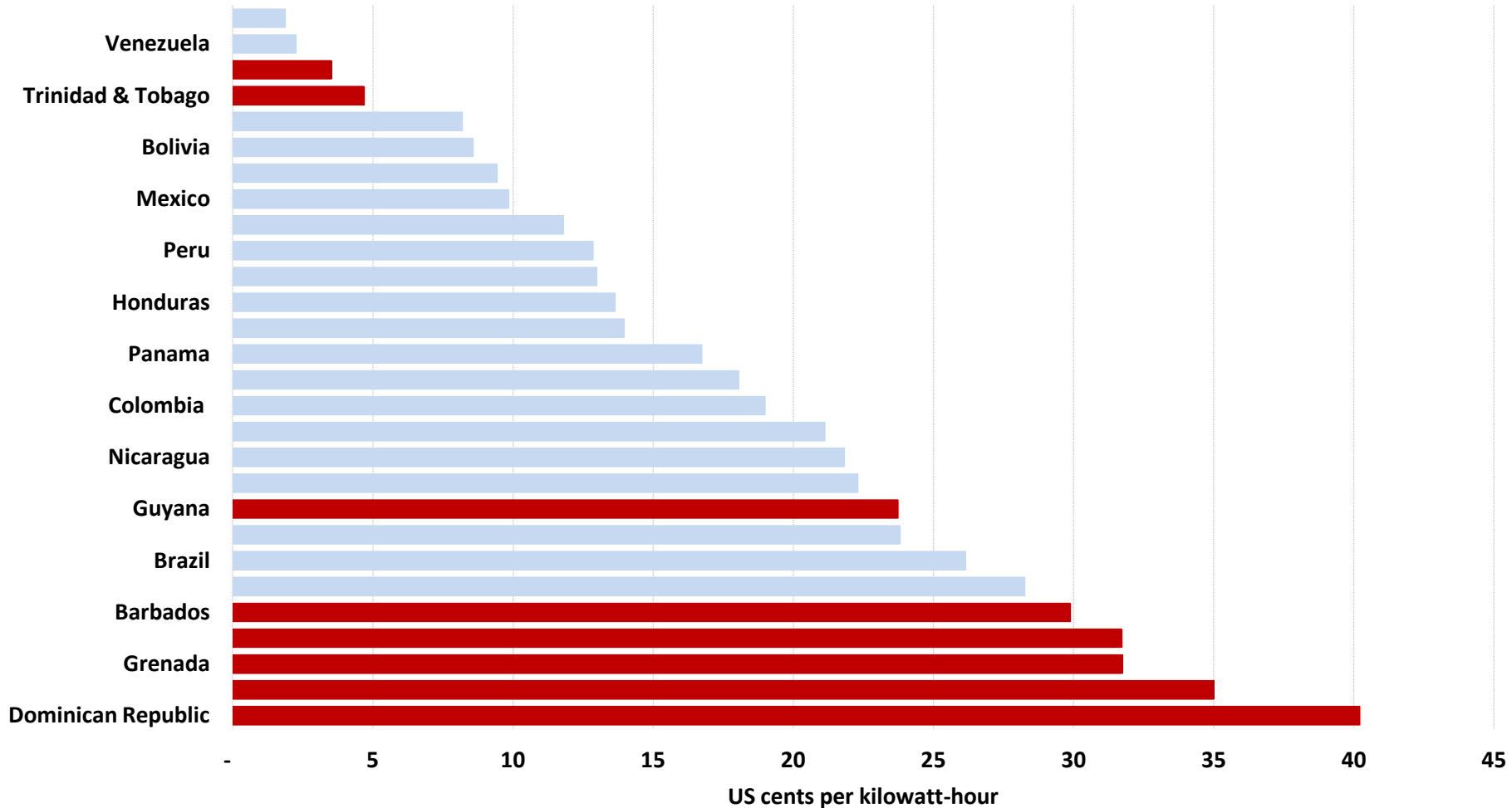
A Problem

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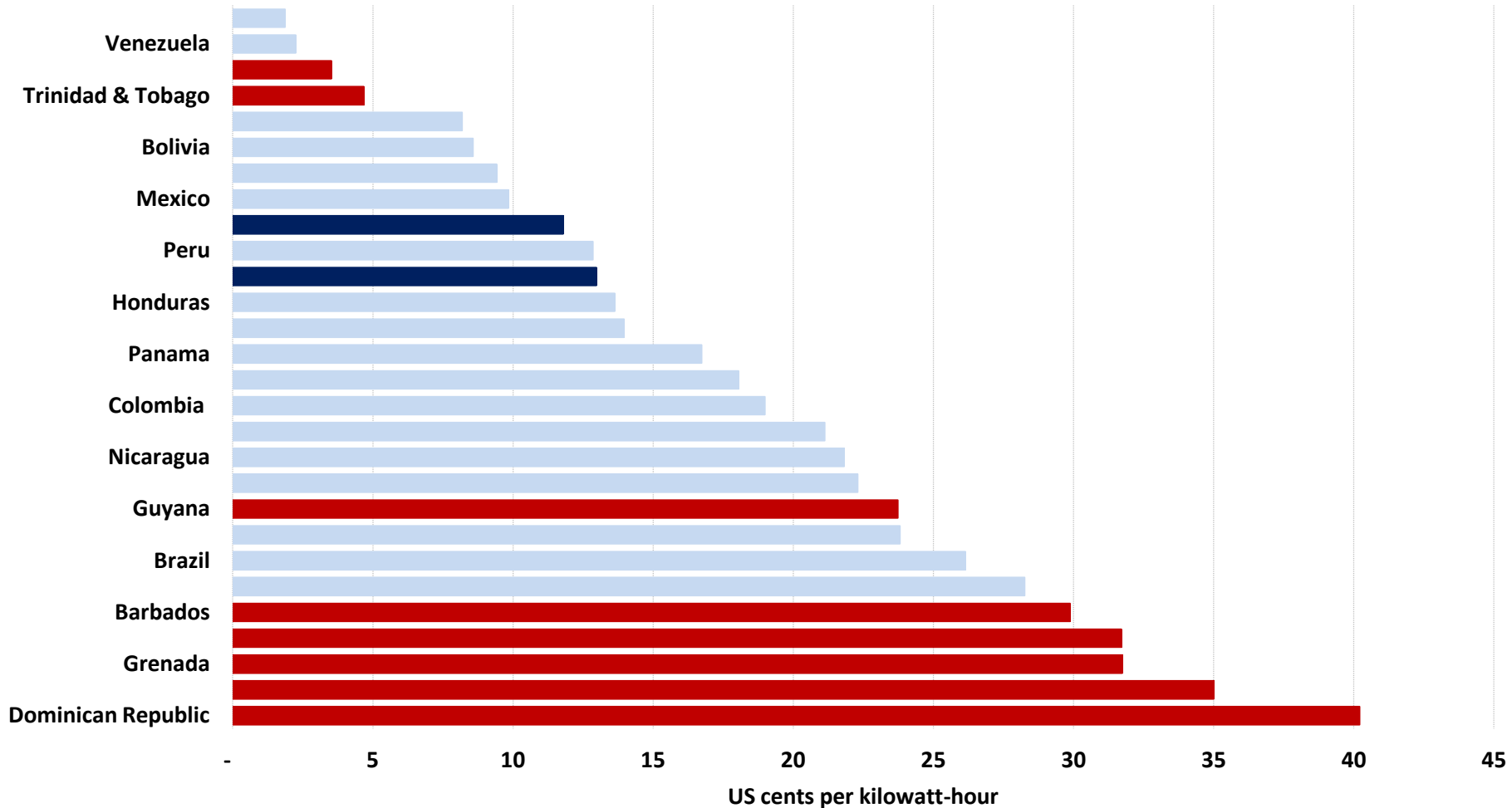
Residents of Caribbean nations face **very high electricity and transportation fuel costs** that have measurably **negative impacts** on its economic performance.



Source: OLADE (2012); EIA (2014)



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Reasons

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What **explains** these
high costs of **energy**?

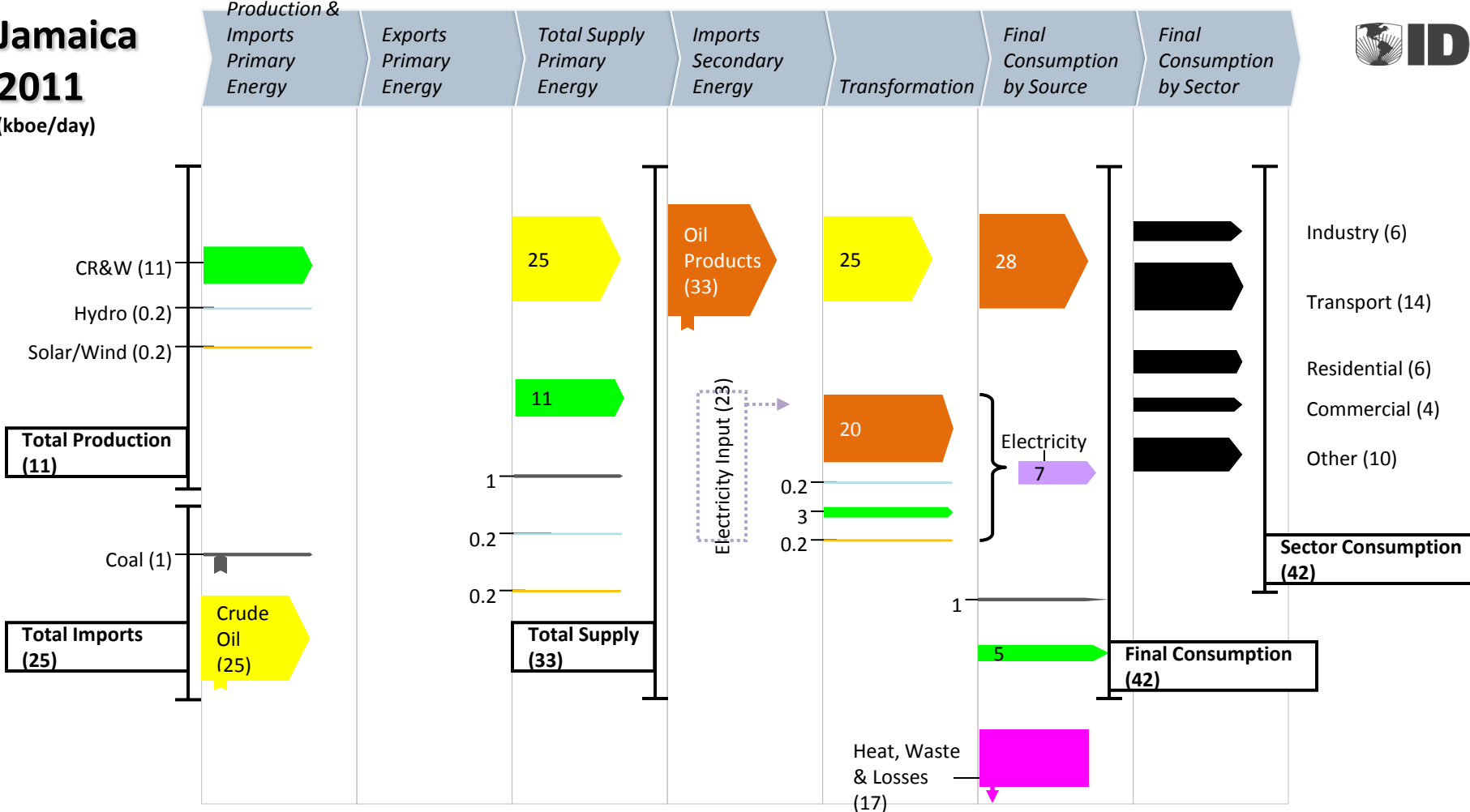
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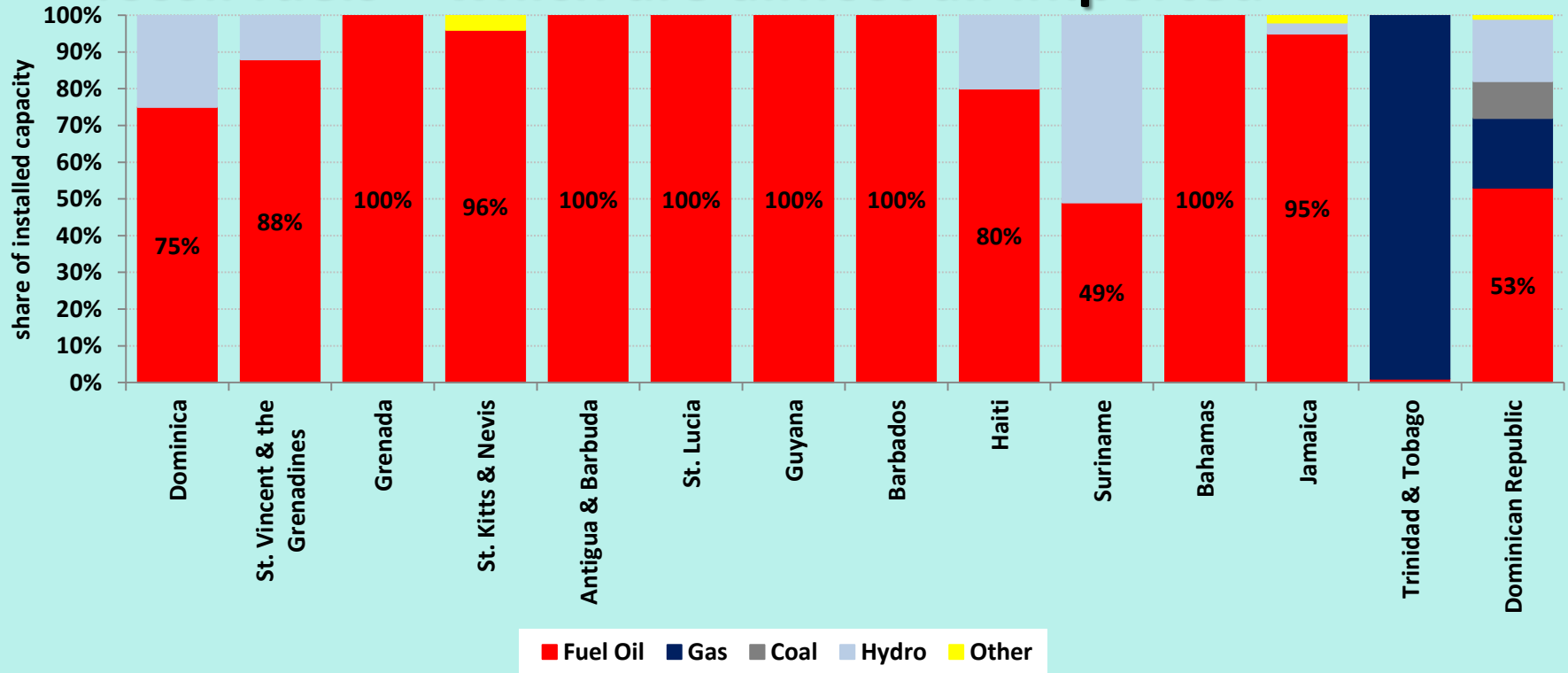
The Jamaican **energy matrix** illustrates
the reasons for these prices

Jamaica 2011

(kboe/day)



○ Almost all generation capacity is thermal, based on fossil fuels – which are almost all imported

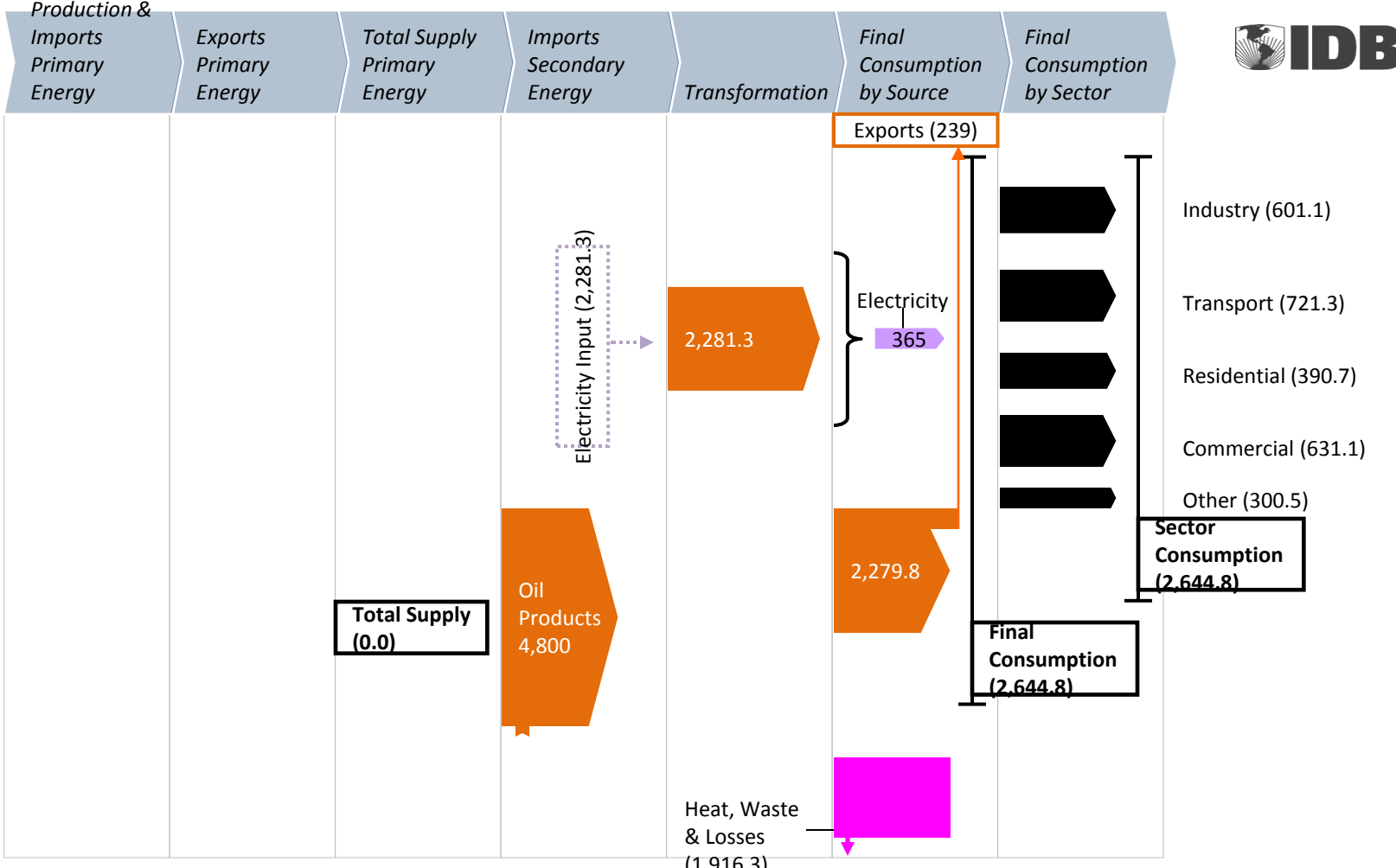


- **All generation capacity is thermal, based on fossil fuels, which are almost all imported**
- **Thermal generation wastes on average around 2/3 of the energy input to generation**
- **Transport uses about ½ of total supply and it's very difficult to shift transport away from oil products on a large scale**
- **Therefore, the realistic scope for generating**

Antigua & Barbuda

2009

(boe/day)



A Solution

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Turning to the scope for improving energy sector efficiency...

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- Diversifying to other thermal**

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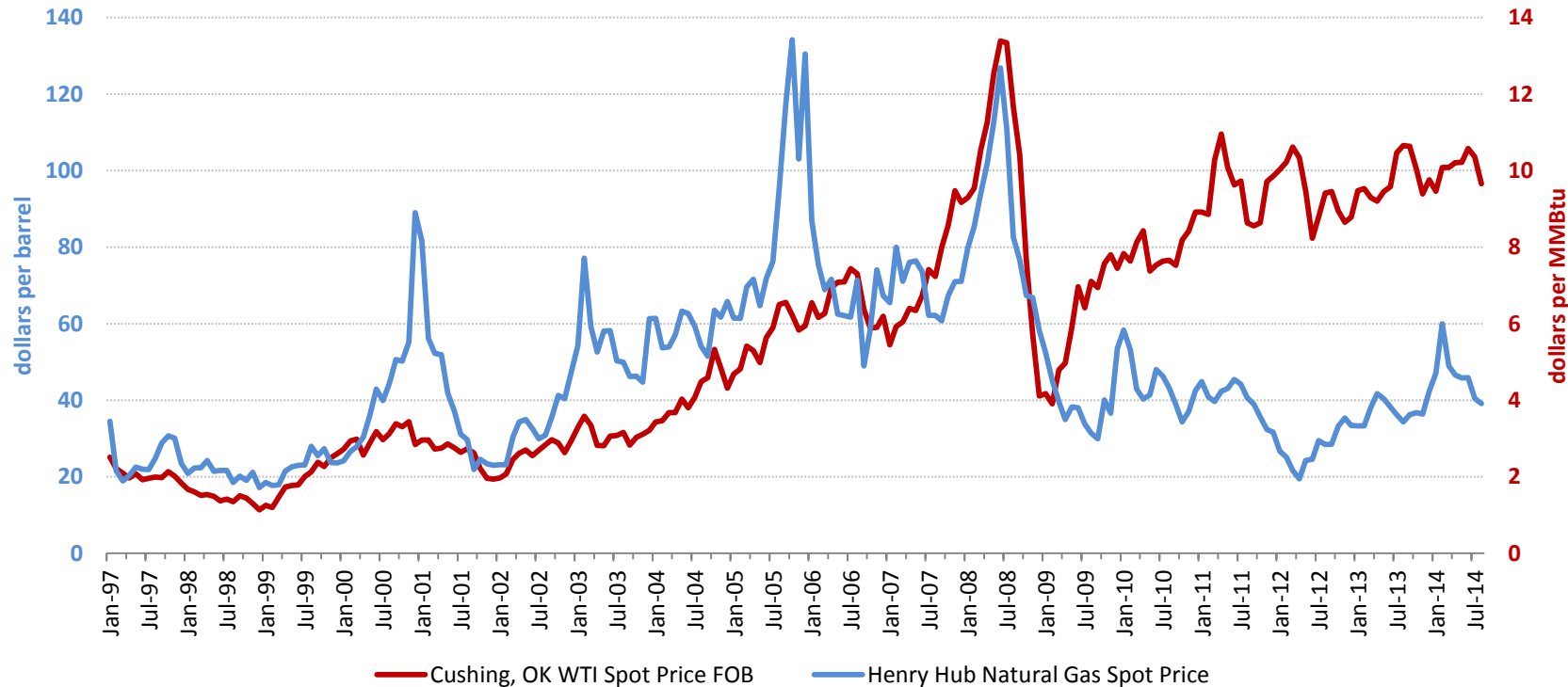
- Diversifying to other thermal**
- Diversifying away from thermal**

A Solution

Turning to the scope for improving energy sector efficiency... there is potential for:

- **Diversifying to other thermal**
- **Diversifying away from thermal**
 - **Solar/wind → intermittency & storage**
 - **Geothermal → geological conditions**

Divergent Gas & Oil Prices



Potential Gas Sources

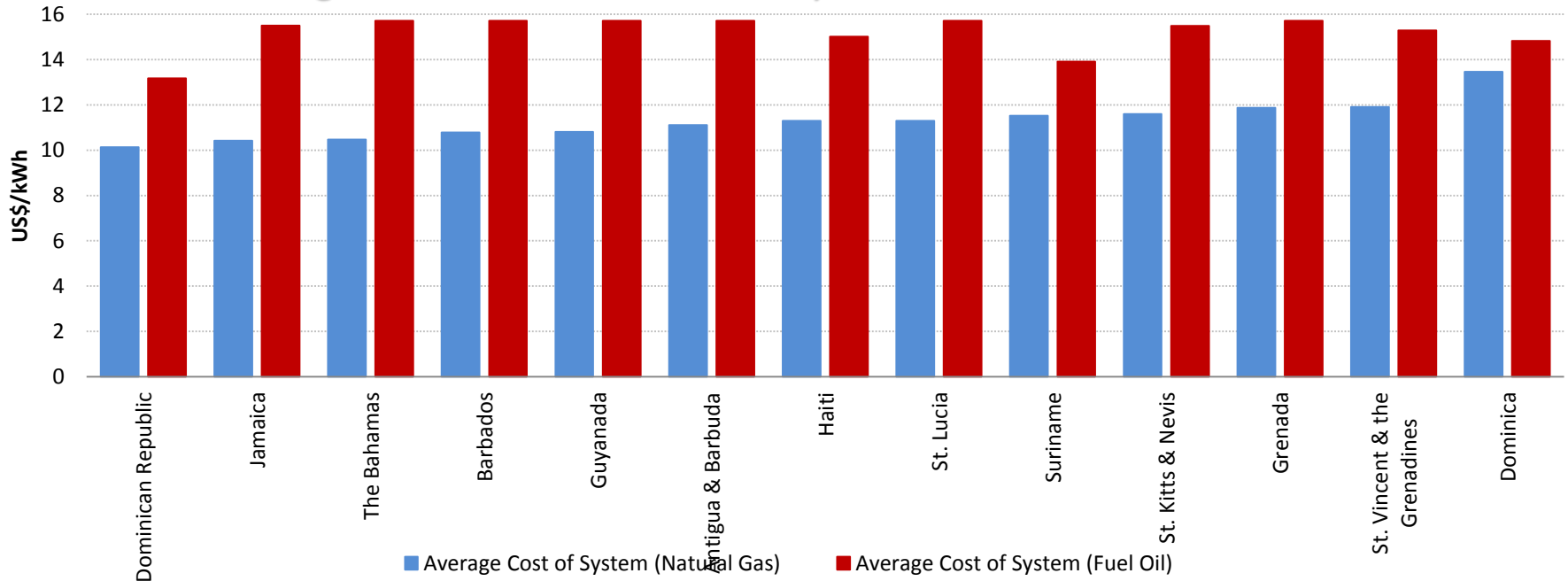


Potential Gas Import Ports

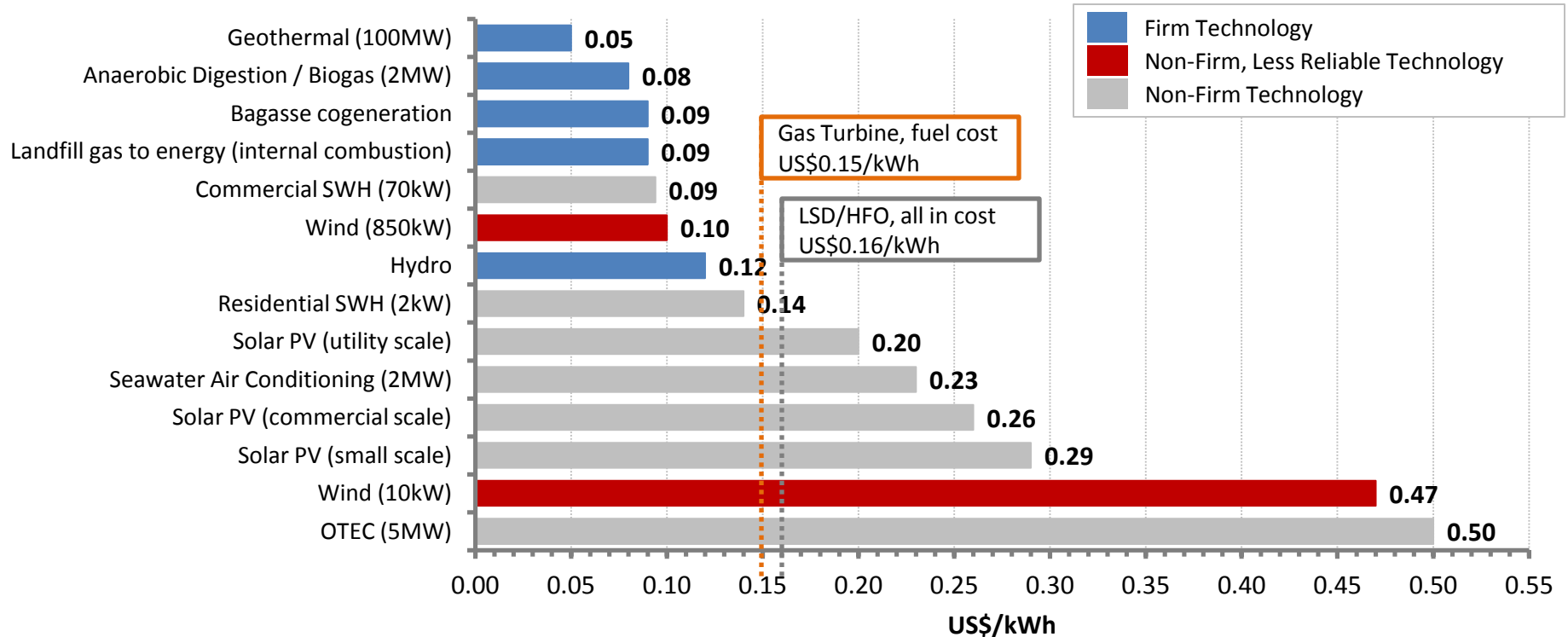


System Cost: Gas vs. Fuel Oil

Introducing natural gas for electricity generation can lead to savings between 20-30% for nearly all countries in the Caribbean



System Cost: Gas vs Other Sources



Conclusions

- Scope for savings from **diversifying from fuel oil to non-conventional renewable sources** (small-scale wind, solar water heating, bagasse) exist **in a small scale**
 - Problems of **intermittency and reliability** remain very important with solar, wind
 - Geothermal is a very attractive solution for countries with the underground endowment
- **Only realistic large-scale diversification** would be from **fuel oil to natural gas**
 - Economies of scale of supply
 - Ability to replace fuel oil with gas for generation
 - Even expanding current NCR installed capacity to 10% of total, reliance on fuel oil remains around 70-90%



Inter-American Development Bank / www.iadb.org