

Global Renewables & Hydropower

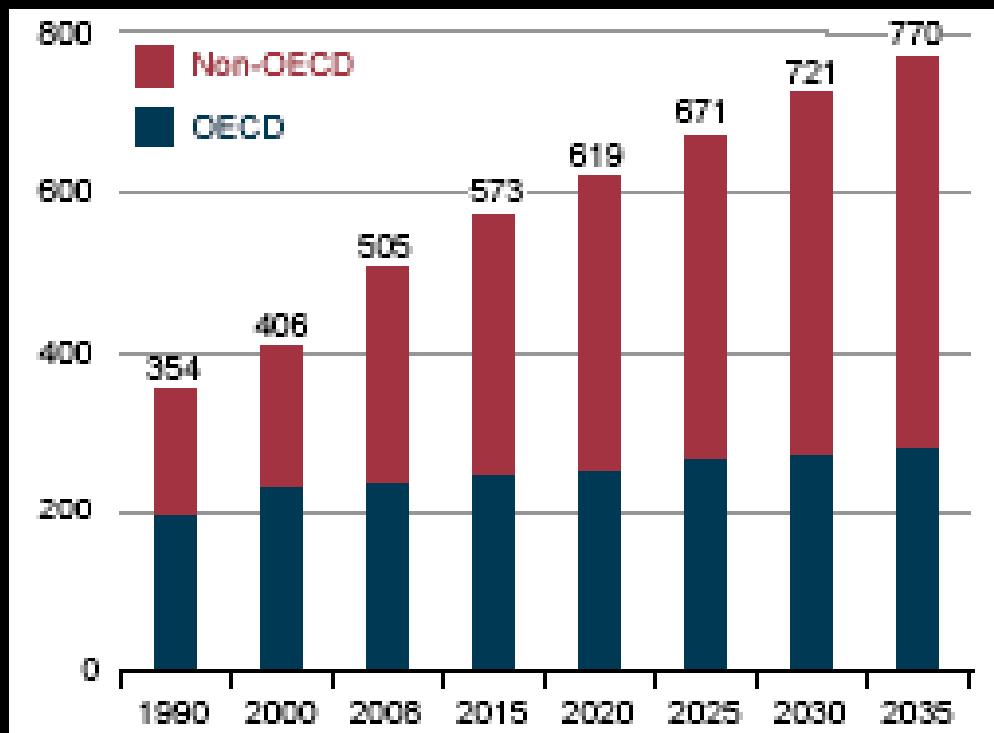


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Global Energy

- ❖ Most significant energy consumption growth in Non-OECD Countries



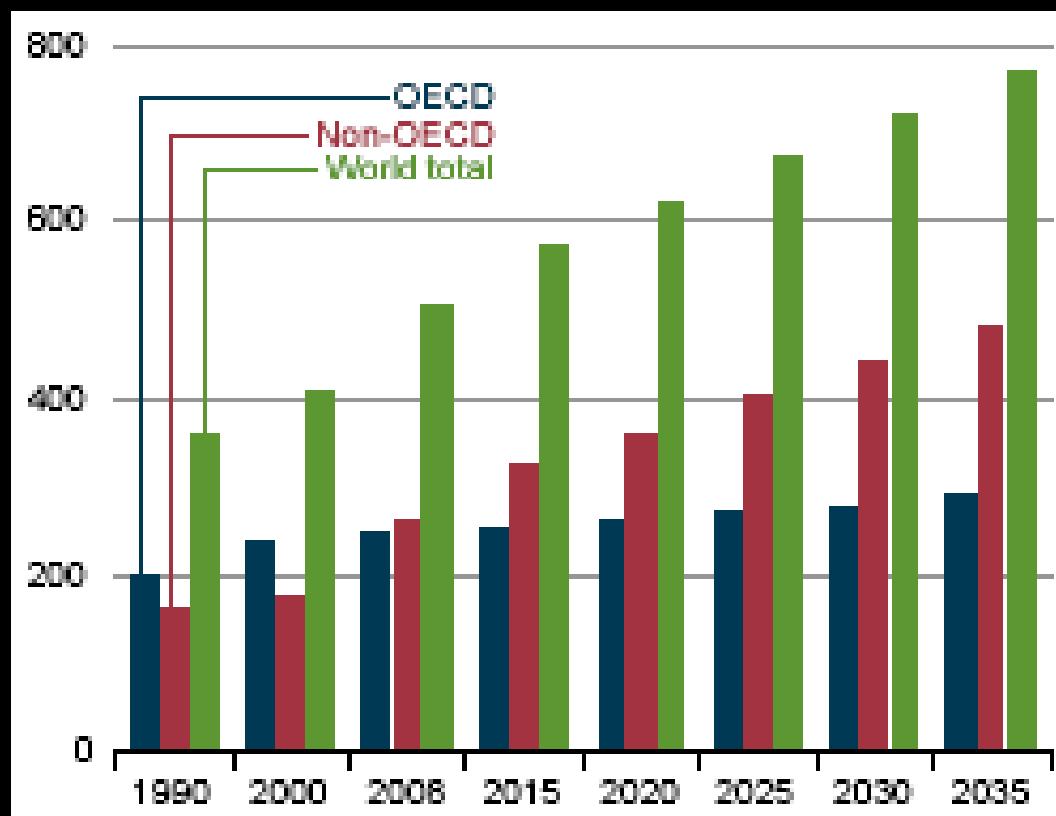
Quadrillion Btu

IEO 2011 Reference Case

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Global Energy

❖ Non-OECD Outpace OECD Countries



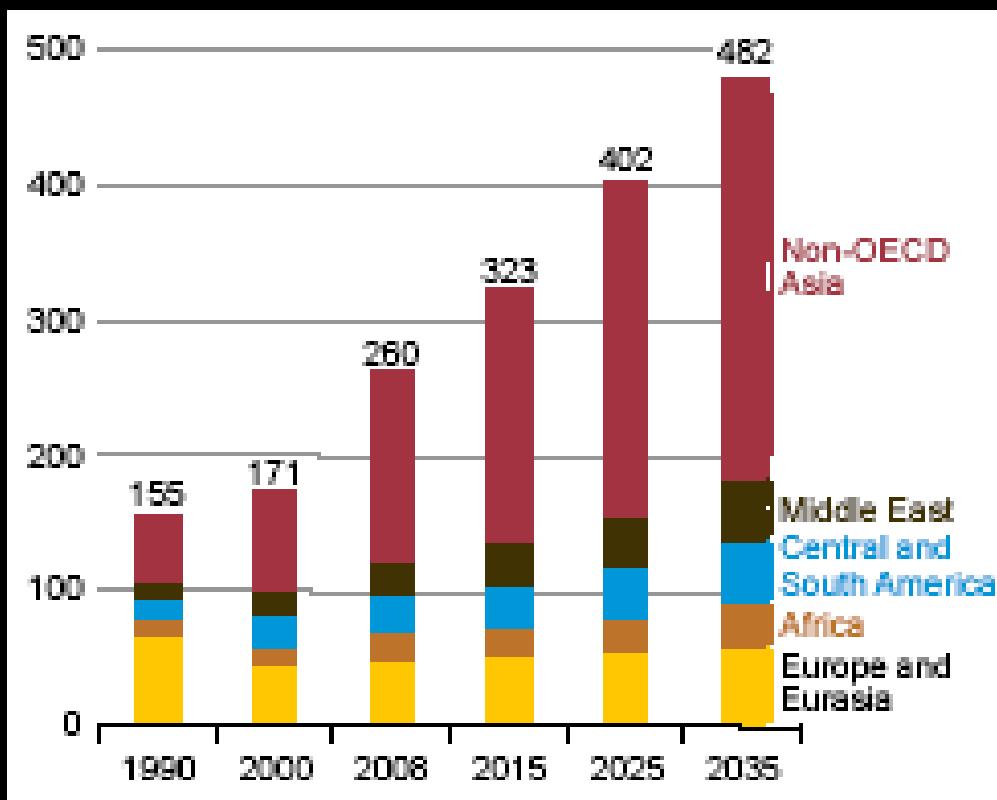
Quadrillion Btu

IEO 2011 Reference Case

3

Global Energy

❖ Non-OECD Energy Consumption



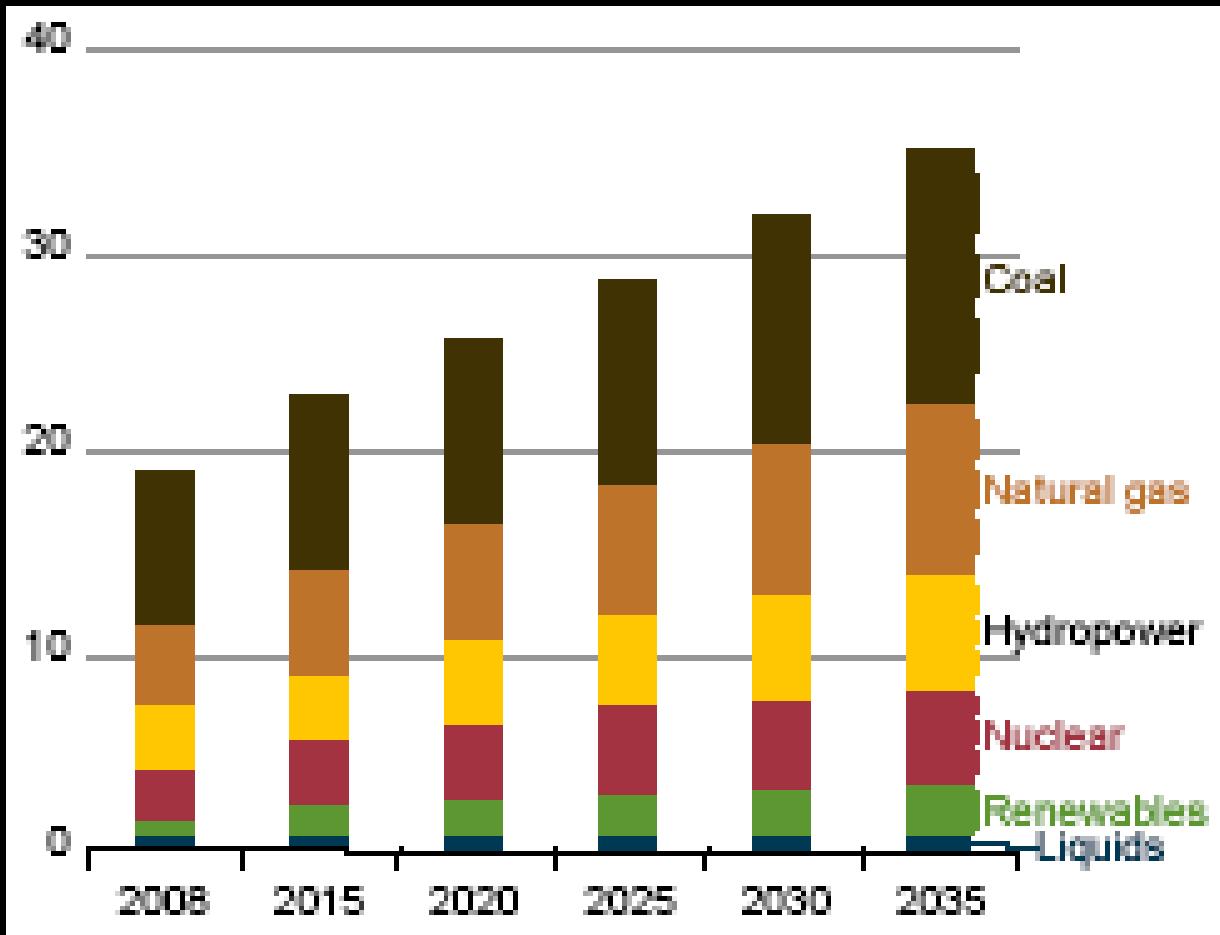
Quadrillion Btu

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Fuels of Choice

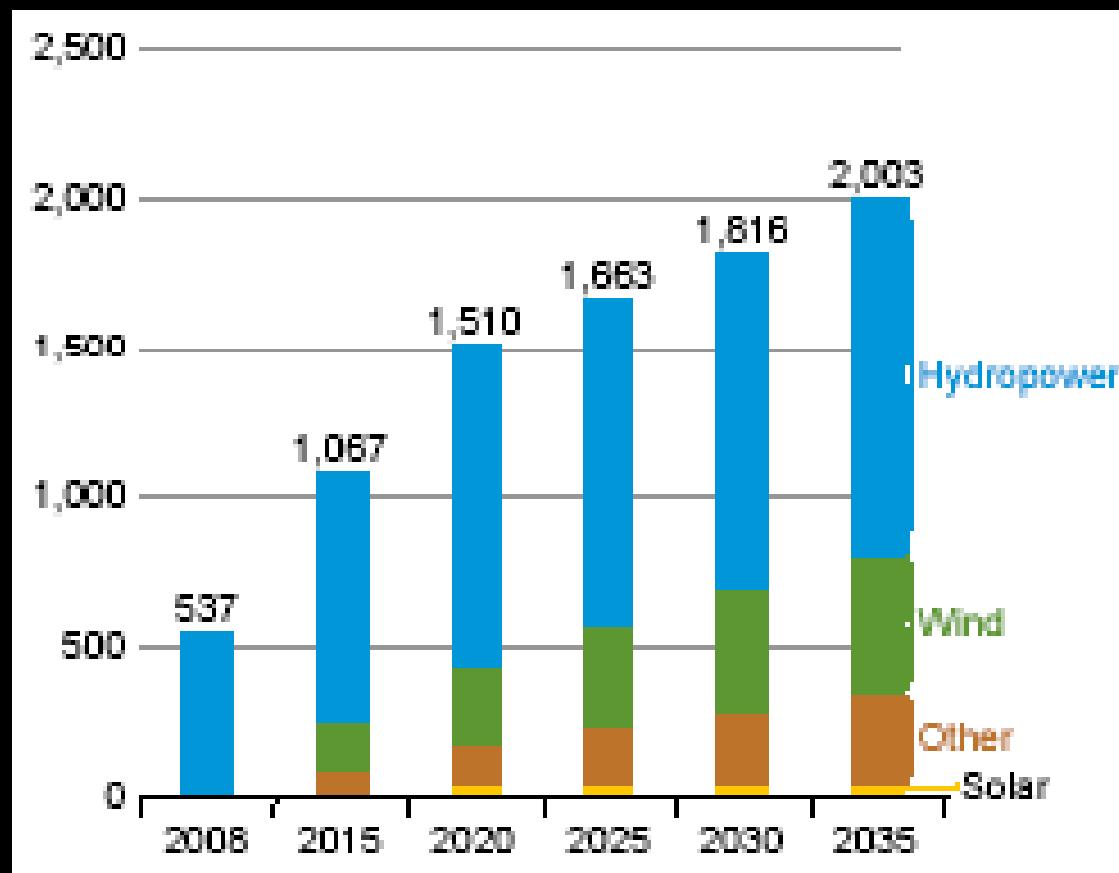


Quadrillion Btu

IEO 2011 Reference Case

Renewable Segment

- ❖ Renewables to grow by factor of 4 by 2035

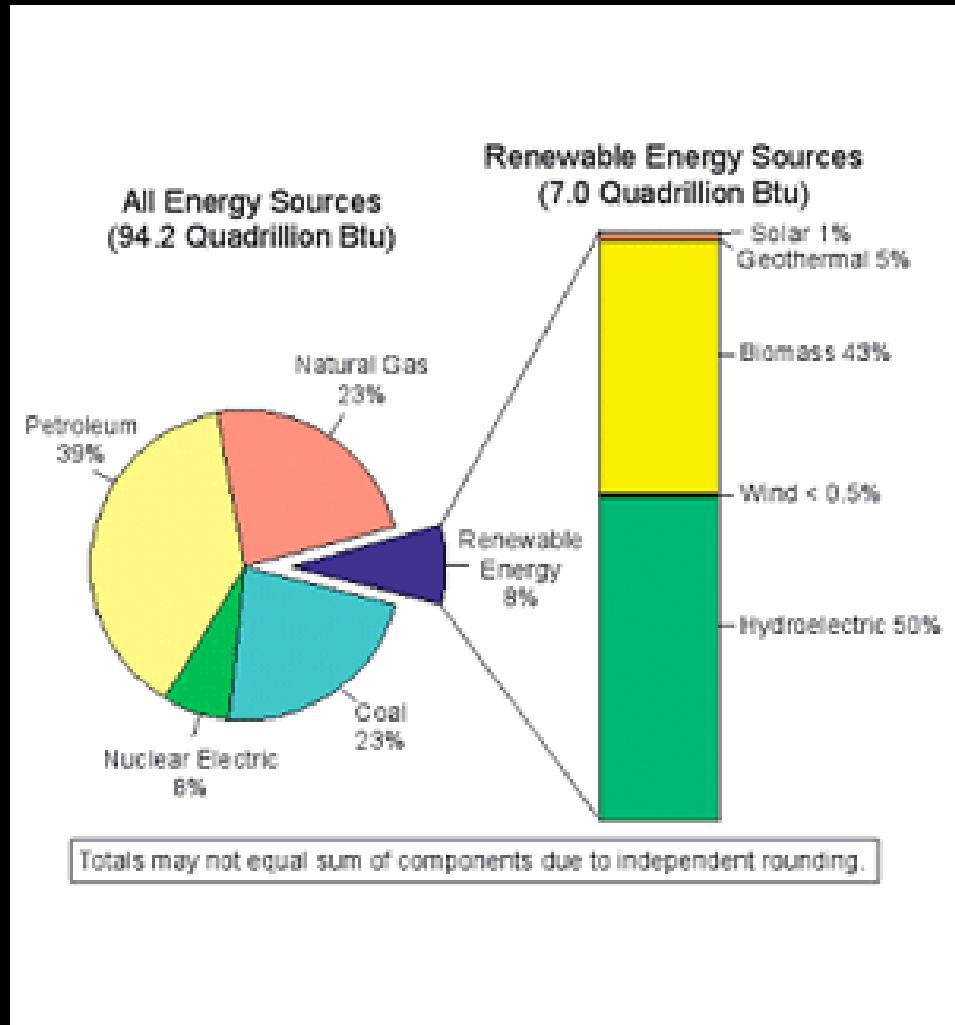


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**Think Efficiency,
Reduce Waste,
Consider
Renewable
Energy;**

USA Big Picture



Renewables Drivers

- ❖ First Cost
- ❖ Fuel Cost
- ❖ Life Cycle Cost
- ❖ Implementation Schedules
- ❖ Tariffs
- ❖ Incentives, Tax Holidays, Tax Credits
- ❖ Game Changer- "Implementation of Carbon Tax"
- ❖ Desire is often different than reality

Hydropower Exports, Market?

Continents

- ❖ Asia (59%)
- ❖ Africa (20%)
- ❖ South America (14%)
- ❖ North & Central America (5%)
- ❖ Europe (2%)

Planned Hydropower

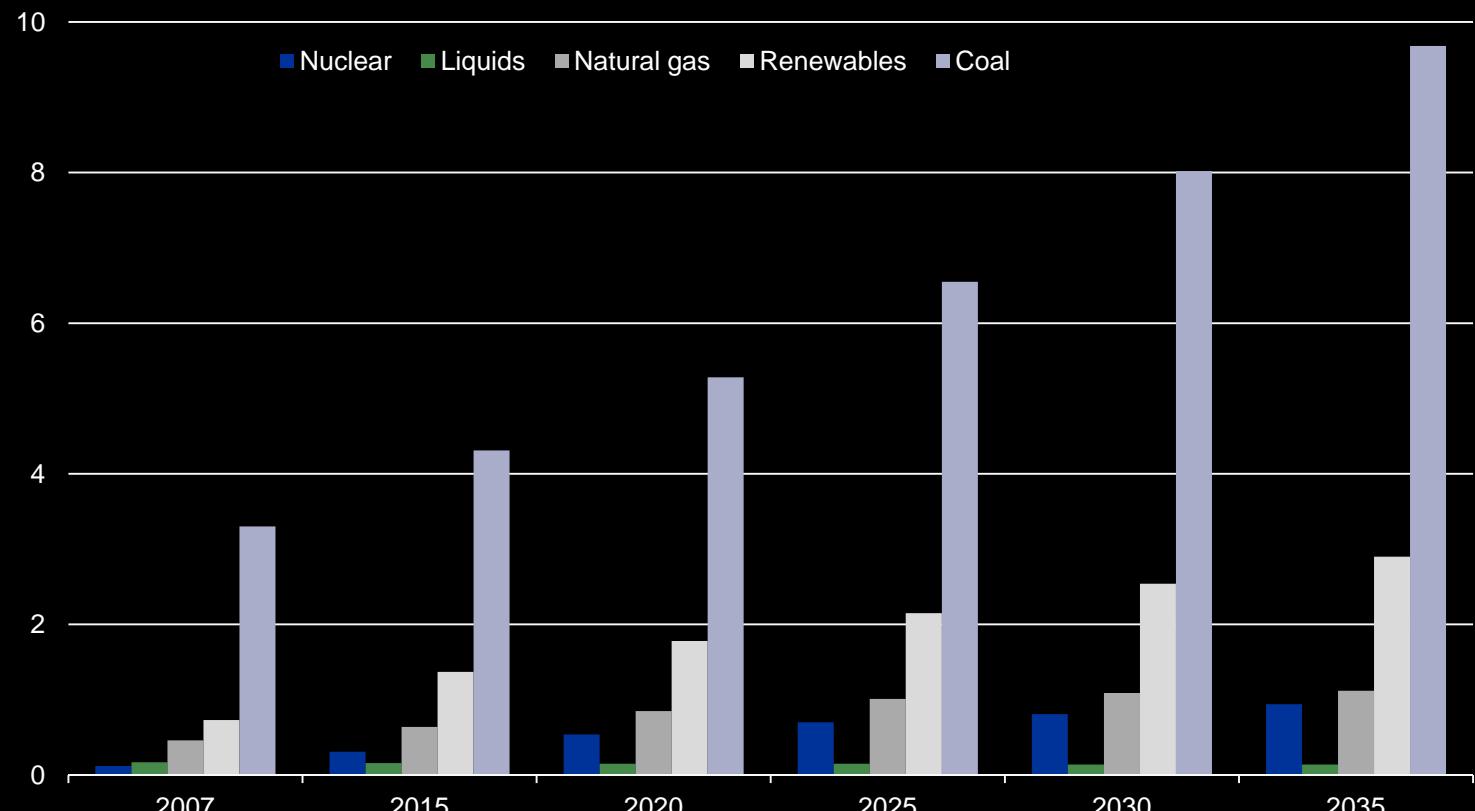
- ❖ 302,000 MW
- ❖ 44,000 MW
- ❖ 65,000 MW
- ❖ 19,000 MW
- ❖ 13,000 MW

- ❖ Total

2006-2007 Reported Data; Multiple Sources; Numbers Rounded to Nearest 1,000.

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Asia



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Select Countries

- ❖ Cambodia
- ❖ China
- ❖ India
- ❖ Indonesia
- ❖ Myanmar
- ❖ Pakistan
- ❖ Russia
- ❖ Tajikistan
- ❖ Thailand
- ❖ Turkey
- ❖ Vietnam

Planned Hydropower

- ❖ 7,700 MW
- ❖ 80,000 MW
- ❖ 55,000 MW
- ❖ 3,200 MW
- ❖ 8,000 MW
- ❖ 22,600 MW
- ❖ 8,200 MW
- ❖ 27,000 MW
- ❖ 4,000 MW
- ❖ 20,000 MW
- ❖ 3,800 MW

Note: Less than 25% of Economically Feasible Hydropower Developed. 11

Asia-Nepal

- ❖ Seeking Private Power Development
- ❖ All Sizes Available Micro, Small, Medium & Large Hydro; Run-of-River & Storage
- ❖ Prime Minister has Declared Energy Emergency Due to Country Black-outs
- ❖ Three Steps
 - ◆ Application for Survey License
 - ◆ Survey License
 - ◆ Construction License

❖ Application for Survey License

- ◆ Below 1 MW-743 Projects; 631 MW
- ◆ 1 to 25 MW-589 Projects; 4,009 MW
- ◆ 25 to 100 MW-73 Projects; 4,076 MW
- ◆ >100 MW-51 Projects; 19,820 MW

❖ Survey Licenses

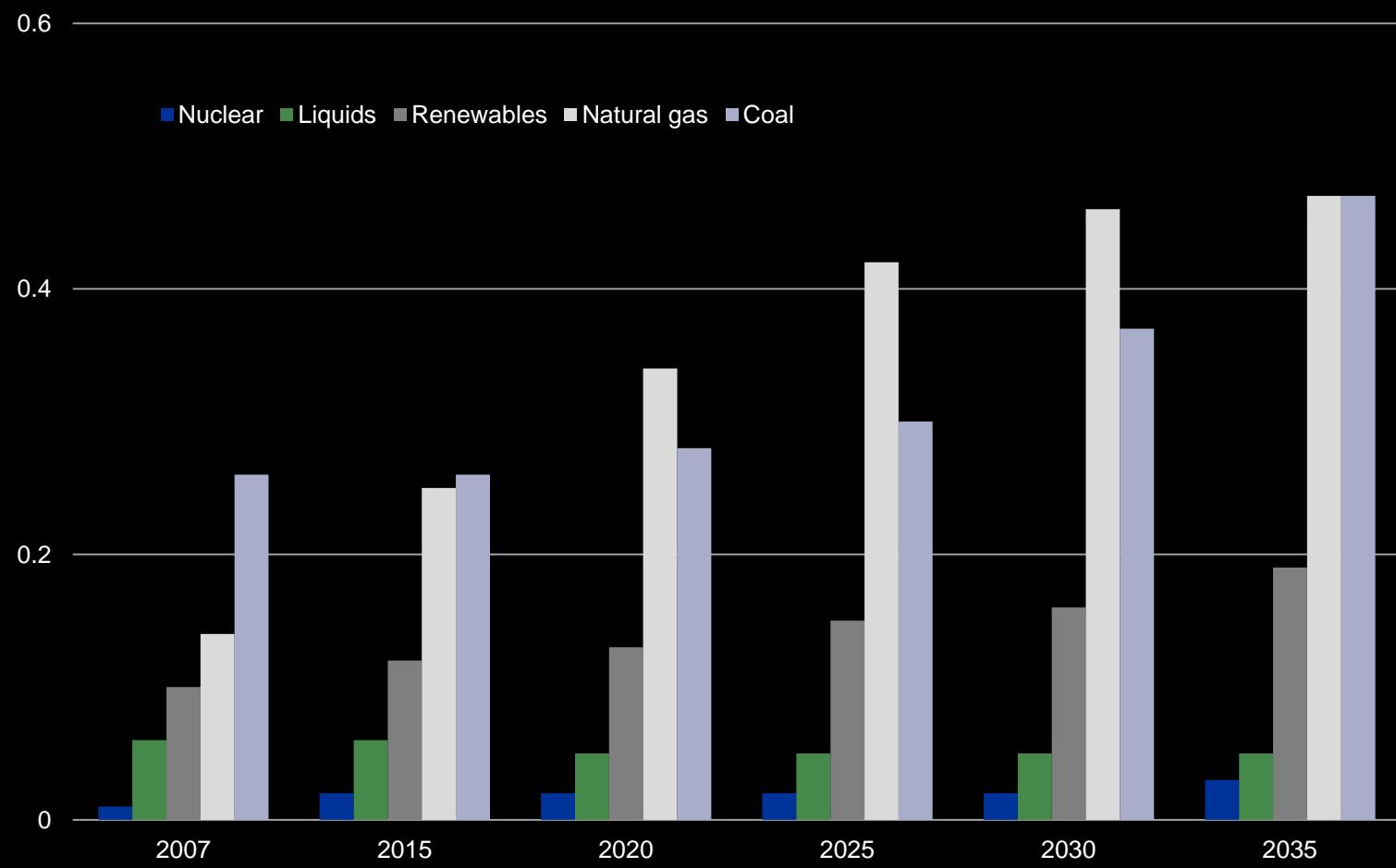
- ◆ Below 1 MW-201 Projects; 149 MW
- ◆ 1 to 25 MW-219 Projects; 1,462 MW
- ◆ 25 to 100 MW-58 Projects; 3,137 MW
- ◆ >100 MW-29 Projects; 8,893 MW

❖ Construction Licenses

- ◆ 58 Projects; 1,353 MW

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Africa



Africa

Select Countries

- ❖ Angola
- ❖ Congo (DR)
- ❖ Ethiopia
- ❖ Mozambique
- ❖ Nigeria
- ❖ Tanzania
- ❖ Zambia

Planned Hydropower

- ❖ 16,000 MW
- ❖ 43,000 MW
- ❖ 4,200 MW
- ❖ 3,900 MW
- ❖ 4,800 MW
- ❖ 2,100 MW
- ❖ 1,300 MW

Note : Less Than 4% of Economically Feasible Hydropower Developed.

Africa-Nigeria

- ❖ Seeking Private Power Development
- ❖ Seeking to Add Hydro Facilities at 17 Existing Dams; Total 179 MW. Stations vary from Micro Hydro @ 0.2 MW to Medium Hydro @ 51 MW
- ❖ Seeking to Construct Two Large Hydro Reservoir Storage Projects:
 - ◆ Zungeru Dam-760 MW
 - ◆ Mambilla Dam-2600 MW

Forgotten Markets With Power Needs

- ❖ Western Africa
- ❖ Sub-Saharan Africa
- ❖ Central American
- ❖ South Asian (Non-China & Non-India Markets)
- ❖ The "Stans"

Providing reliable power and potable water improves country political and economic stability.

Development Risk

- ❖ Choose Countries Carefully
- ❖ Tariffs with Escalation
- ❖ Long Term PPAs
- ❖ Get Use to Saying "No"
- ❖ If It Doesn't Make Business Sense, Say "No"
- ❖ If You Smell Corruption, Say "No"
- ❖ Do Due Diligence Before Saying "Yes"

- ❖ Compete on Value, Not Price
- ❖ Low Price; Often Not Good Value
- ❖ Many Rabbits



Some Common Issues

- ❖ Price
- ❖ Contract Terms
- ❖ Delivery
- ❖ Payment
- ❖ Claims & Process
- ❖ Culture
- ❖ Taxes, Hidden Taxes
- ❖ Import Duties
- ❖ Shipment Damage
- ❖ Receiving Damage
- ❖ Political Issues
- ❖ Corruption
- ❖ Unfair Trade Practices
- ❖ Temporary Storage
- ❖ Repair
- ❖ Warranty
- ❖ Insurance
- ❖ Force Majeure
- ❖ Work Visas
- ❖ Site & Personnel Security
- ❖ Project & Land Ownership
- ❖ Other

Conclusion

- ❖ Non-OECD country energy needs will grow about 4 to 6 times faster than OECD countries.
- ❖ Consider Project Risks Like a Business Does.
- ❖ Stream line approval processes.
- ❖ Investors want "guaranteed" results.
- ❖ Good Non-OECD and OECD country projects are financed everyday.
- ❖ Market Segment is Very Large.
- ❖ Consider "Forgotten" Markets.

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