

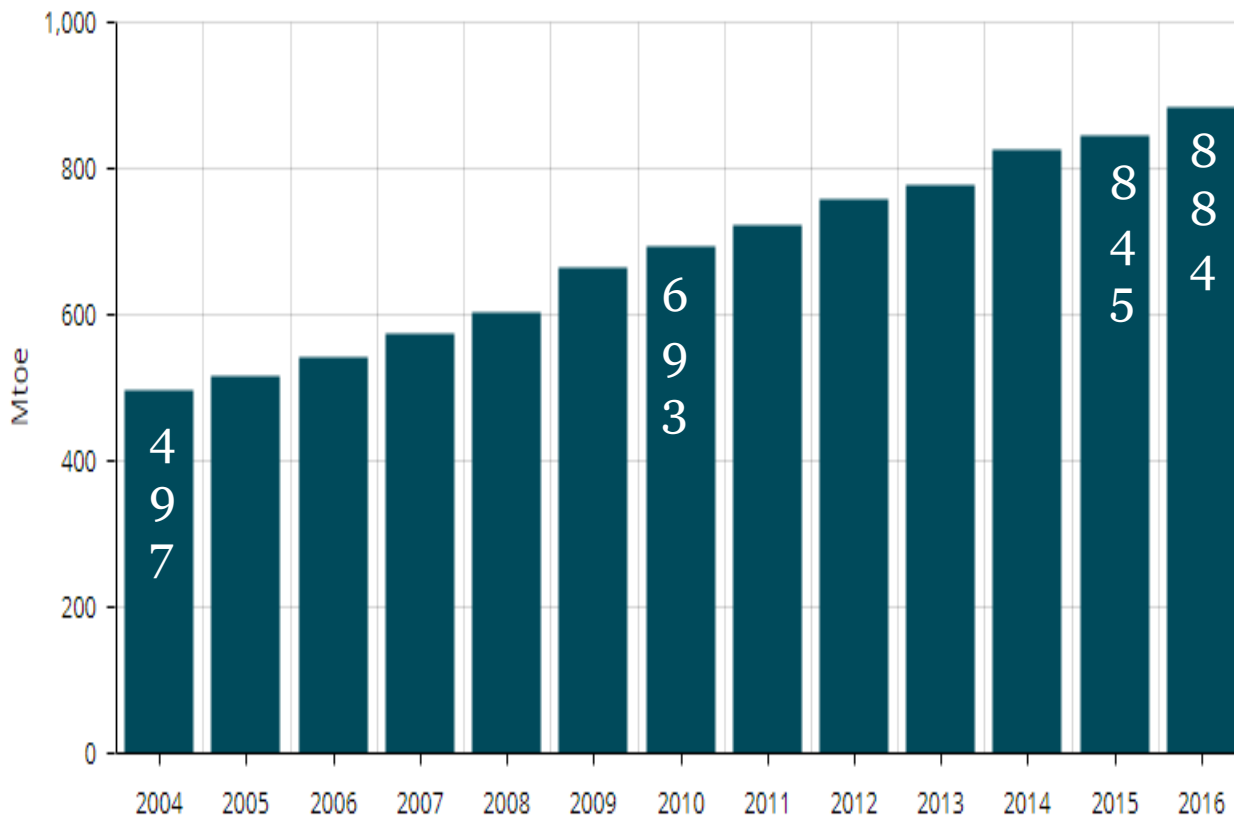
ENERGY SECURITY



WHY NOW?

- To meet the energy demands of the country with the growing income levels and the ever increasing population.
- Dependency on energy imports have gone up from 17% in 1991 to 30 % in 2004-05.
- Of which oil constituted 72% in that year and close to 90% in 2015.

ENERGY CONSUMPTION- INDIA



WHAT IS ENERGY SECURITY?

- World energy assessment report defines it as the continuous availability of energy in different forms in sufficient quantities and reasonable prices.
- In India, energy security can be defined with the following points,`

INDIAN SCENARIO

- All the citizens
- Lifeline energy
- Effective demand
- Safe and convenient energy
- Reasonable prices
- At all times
- At expected levels, irrespective of the
- Shocks and disruptions

THE NATURE OF THE PROBLEM

- Growing demand- will we get the energy we want even if we are willing to pay whatever the price it costs?
- Supply risk- Shocks and disruptions.
- Market risk- Shocks and disruptions.
- Technical risks.

POLICY OPTIONS

- REDUCING RISKS-

- Improving efficiency; reducing need
- Reducing demand of import
- Using other sources (renewable energy).

- DEALING WITH RISK-

- Ability to withstand shocks
- Increase strength to import
- Reduce technical risks.

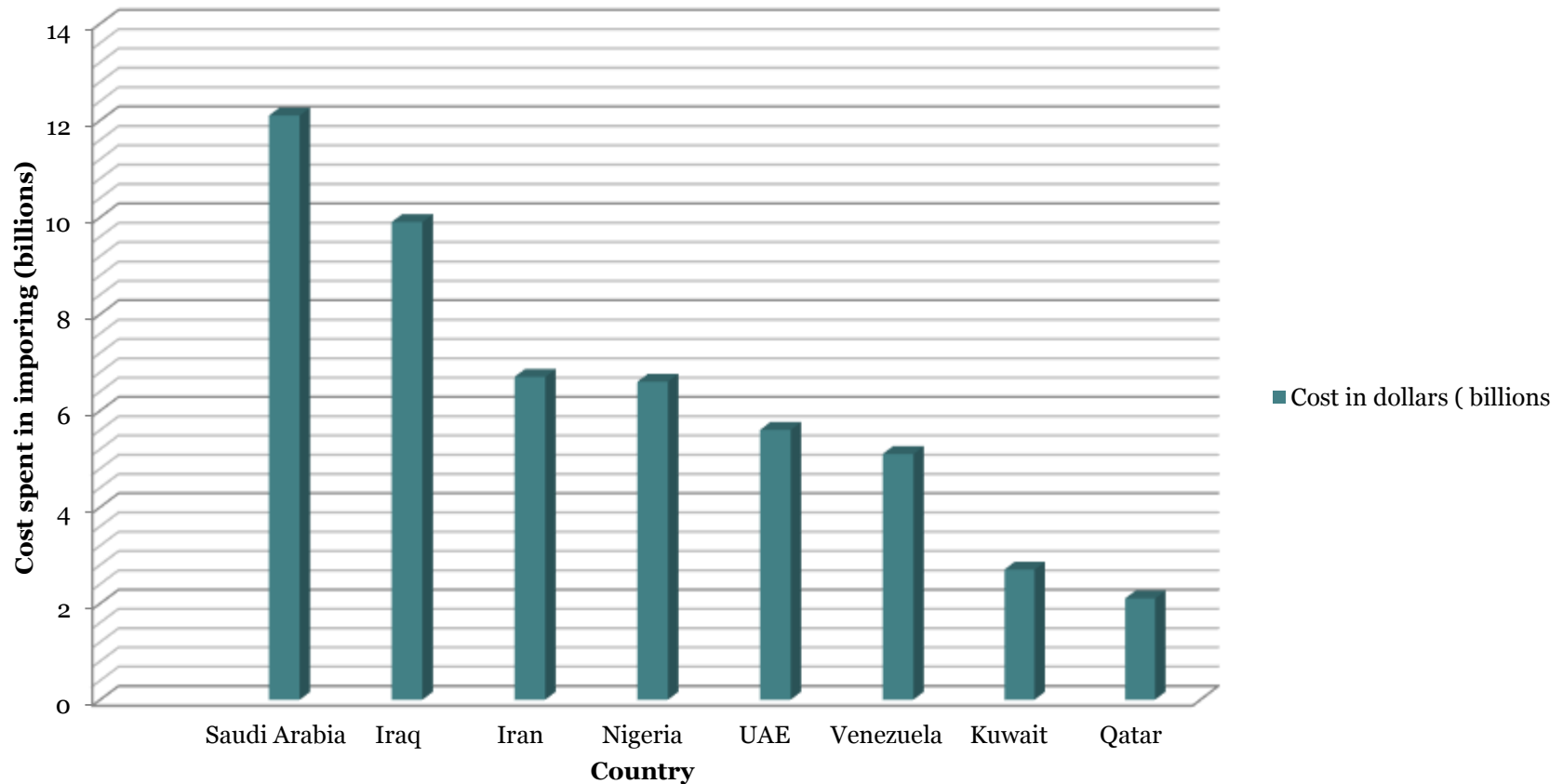
REDUCING DEMAND

- Improve working efficiency of plants.
- Using energy efficient appliances.
- Promotion of public transport.
- Using railways rather than private transport.

MULTIPLE SUPPLY SOURCES

- Not depending on particular source of fuel, if so even if one fuel is affected it can be compensated with the help of another.
- By doing so, if suppose rationing of fuel is required it wont be a costly as it will be if we depend on only particular source.

Major crude oil importers - 2016



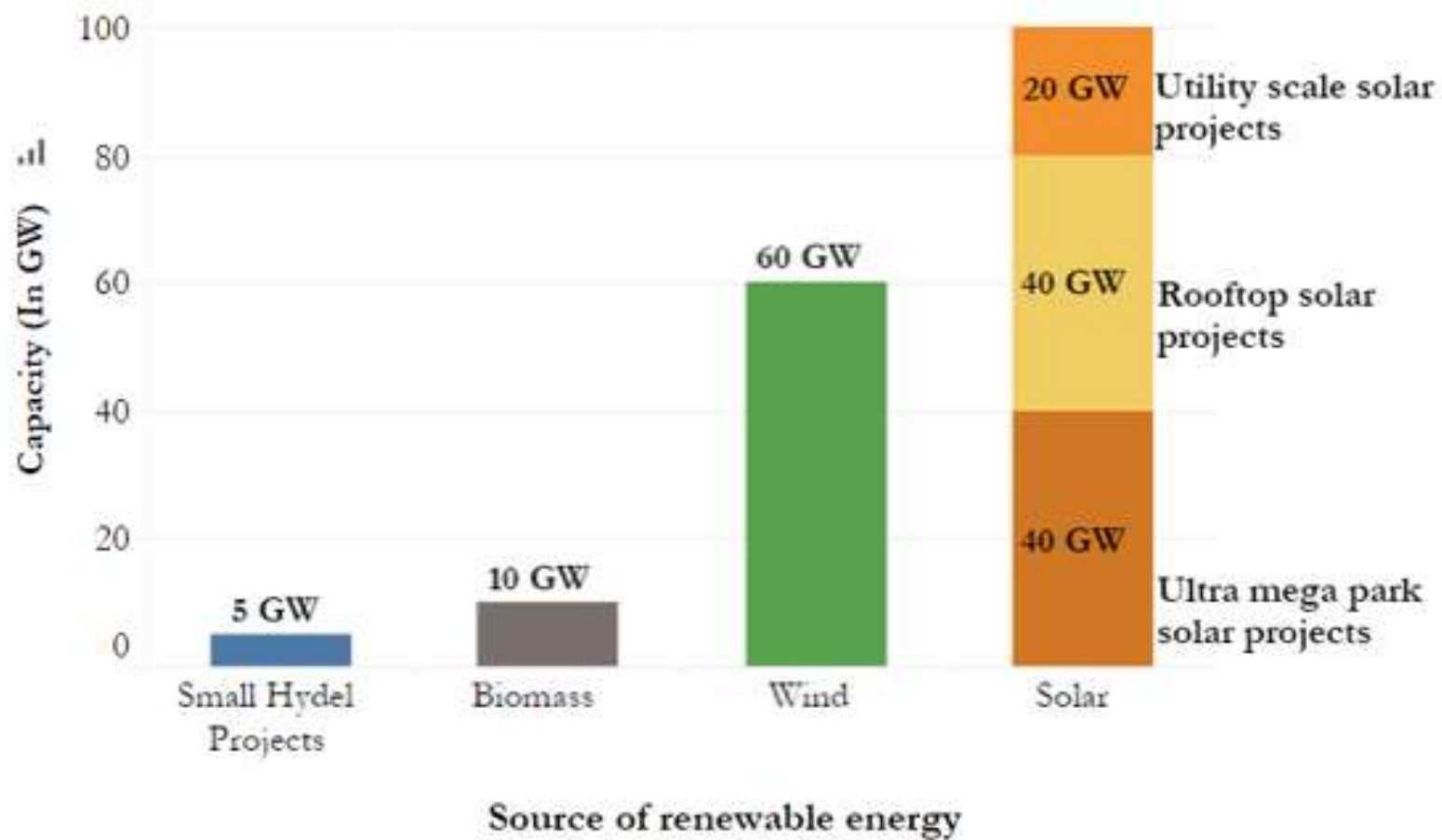
SUBSTITUTING THE IMPORTS

- Electrification – Cars and locomotives.
- Using bio-diesel and ethanol rather than diesel and petrol.
- Development of hydrogen based cells.
- Liquefaction of coal to form oil(Sasol, South Africa)

ALTERNATIVE ENERGY SOURCES

- Better technology related to mining can improve the recovery of oil and coal by 5-10%.
- Solar
- Wind
- Nuclear
- Energy plantation / crops
- Exploration into ways to improve the efficiency using nanotechnology.

India's 2022 Renewable Energy Target



WITHSTAND SUPPLY SHOCKS

- Maintaining a strategic reserve/ stock for when an inevitable war/ strike breaks out thus disrupting the sale of fuel.
- IEA country members currently have a stock for about 90 days which they plan to extend up to 120 days.
- By doing so, the government will be able to maintain a steady price.

- Currently in India we have a strategic stock reserve which will last for 85 days (excluding the energy required to maintain our Indian army).
- Oil companies like Indian oil, Bharath Petroleum and others have been asked to maintain a reserve within their company also.

MARKET AND TECHNICAL RISKS

- The market risk can be handled by building reserves within the country.
- Schemes which reduce the taxes and other custom duty involved in importing costs.
- The technical risks can be reduced by design modifications within the system which prevent the over load during peak demand hours.

CHALLENGES TO ENERGY SECURITY

- Only 22% of our sedimentary basins have been explored for energy resources. The rest are oscillating between 'exploration initiated' to 'poorly explored'.
- Rising import demands from ~76% in FY11 to ~85% in FY17 and import dependence on natural gas is expected to increase from ~21% in FY11 to 35% in FY17.

- Pricing is a huge concern in the hydrocarbon and coal sector, as domestic prices are often disconnected from global trends.
- Regulatory uncertainties come in the way of investments in the oil and gas upstream sector.
- It would do well if an independent regulator were to oversee contract administration, monitoring and review.
- At present, the government is involved in these tasks. The downstream sector is yet evolving in terms of policies

- The last few slides gave us a general outlook as to how we can be secured in the energy department, but the real problem with our country isn't about supplying power to all, it is supplying Life line energy at reasonable prices.



Thank you.