

The future of India's energy sector

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Introduction: KAPSARC's mission and structure

An independent non-profit research center focused on energy economics & policy

Advance understanding of energy economics and act as a catalyst for dialogue, charting a path to better welfare for societies, locally and globally.

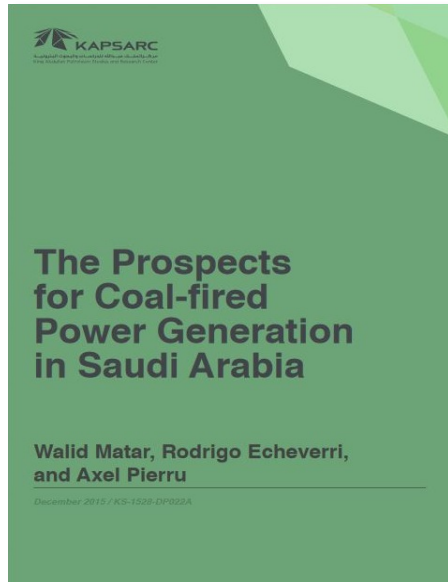
Strategic Objectives

Develop sustainable economic frameworks that lead to:

- Lower societal costs of energy supply
- Higher value created from energy consumption
- Better alignment between energy policy objectives and outcomes

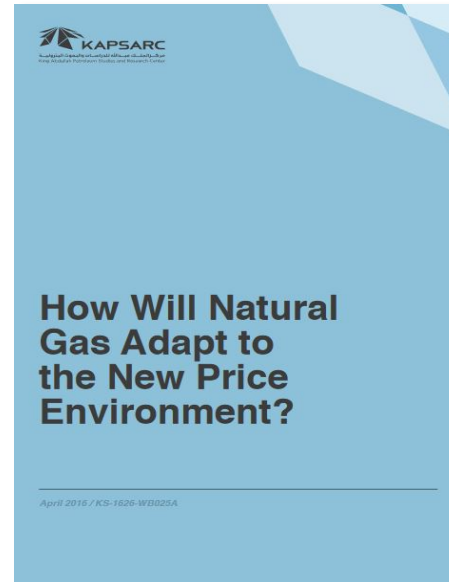
Discussion Papers

A KAPSARC research paper



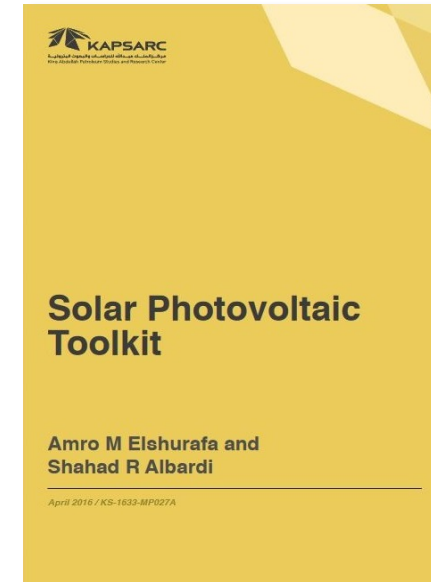
Workshop Briefs

A short, 7-10 page, non-attributional, summary of a KAPSARC Energy Workshop



Tools and Datasets

Databases (such as policy dB, weather ... etc.) or "tools" such as models (e.g. CGE model source code or models for collective decision-making processes)



Research Programs and Focus Areas

Energy Systems and Macroecono	Policy and Decision Science	Energy Demand Efficiency	Transportation and Urban Infrastructure	Markets and Industrial	Energy Transitions and Climate
Allocating Energy Resources in an Economy					
Energy Flows and Market Impacts					
Energy Transitions					
Social and Environmental Spillovers of Energy Policy Choices					
Energy Productivity					
Transportation: Modes, Fuels and Technologies					

Research Initiatives 2018

- Productivity and Economic Diversification
- Energy and Economic Vulnerability
- Opportunity costs for oil and gas in Saudi Arabia
- Future of transportation fuel demand (freight and passenger)
- Future of global oil and natural gas markets
- Regional energy markets (GCC, India, China)
- Electricity sector transitions
- Climate change policies and governance

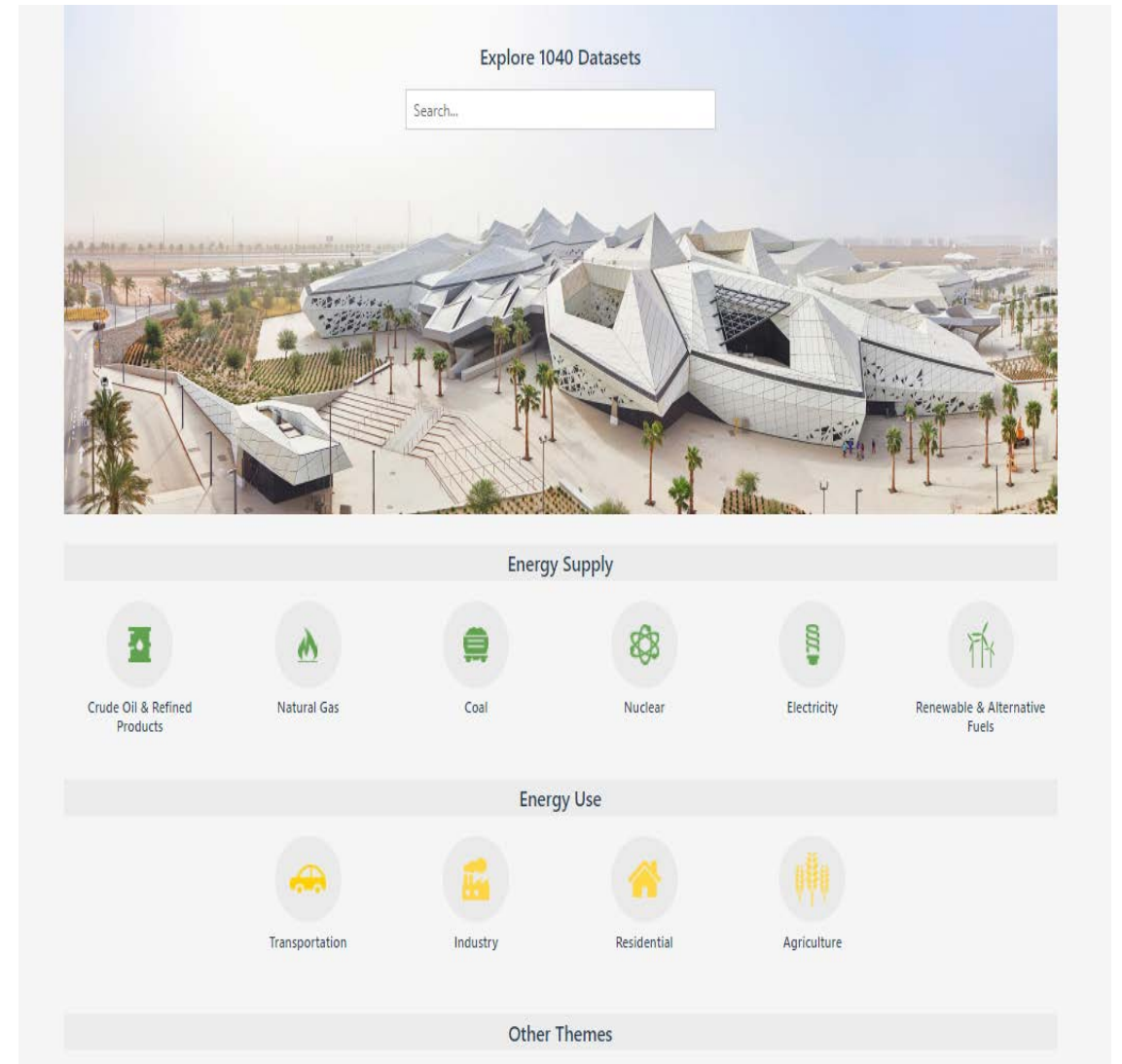


- Government, Industrial, Academic and Global Institution
- Joint-research, Workshop Brief
- Publications, Data, and Models
- Workshops
- OpenKAPSARC
- Visiting Researchers
- Non-Profit Advisory Services



About KAPSARC Data Portal

- KAPSARC launched open data portal to public in 2016, grown to over 1000 public datasets
- The portal is designed to enable users to better understand energy, economy and environment
- Critical energy data from many sources is now available in easy to use platform
- The portal is available to anyone seeking energy data for research



Web Apps

- Several open web applications and tools for researchers are published on OpenKAPSARC showcasing the models developed by KAPSARC

KAPSARC
مركز الملك عبد الله للدراسات والبحوث البترولية
King Abdullah Petroleum Studies and Research Center

Home Research Researchers External Publications **OpenKAPSARC** News & Events About Careers

OpenKAPSARC

Our goal is to advance the understanding of energy economics policy by sharing our research insights and knowledge. This is why KAPSARC will freely share everything we own and produce with anyone who wants it.

Within OpenKAPSARC you will find software and models that are fully licensed for use. In addition, you can access hundreds of energy datasets that we have sourced from various public data sources. Each of these datasets have an information tab which shows the source and data use license. These datasets are model ready, machine-readable (API ready).

KAPSARC Energy Data Portal

Go To App Details

KAPSARC Insights

Go To App Details

KAPSARC Building Energy Assessment Tool

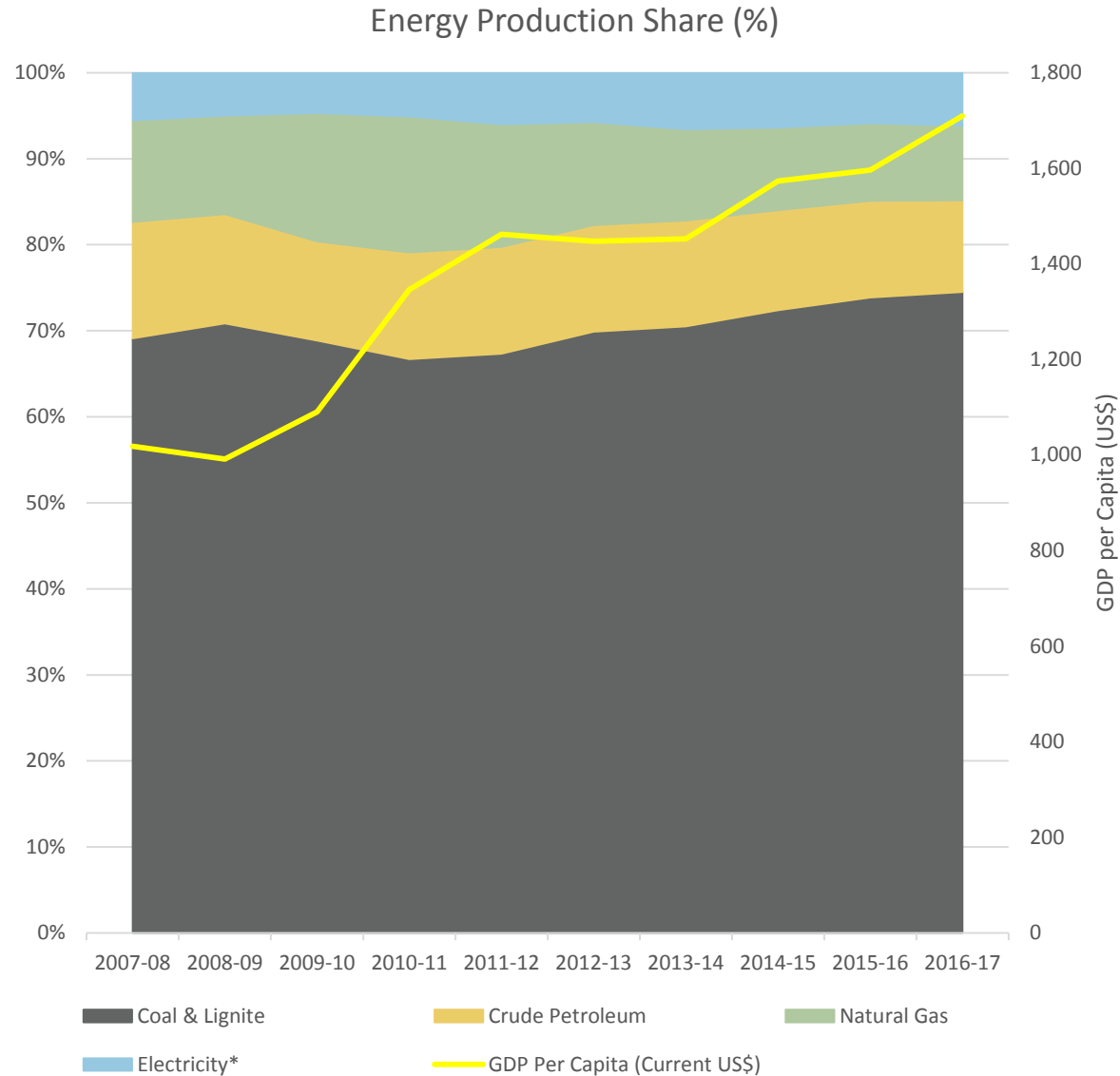
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KAPSARC Global Energy Macroeconometric Model

KAPSARC Energy Model for Saudi Arabia

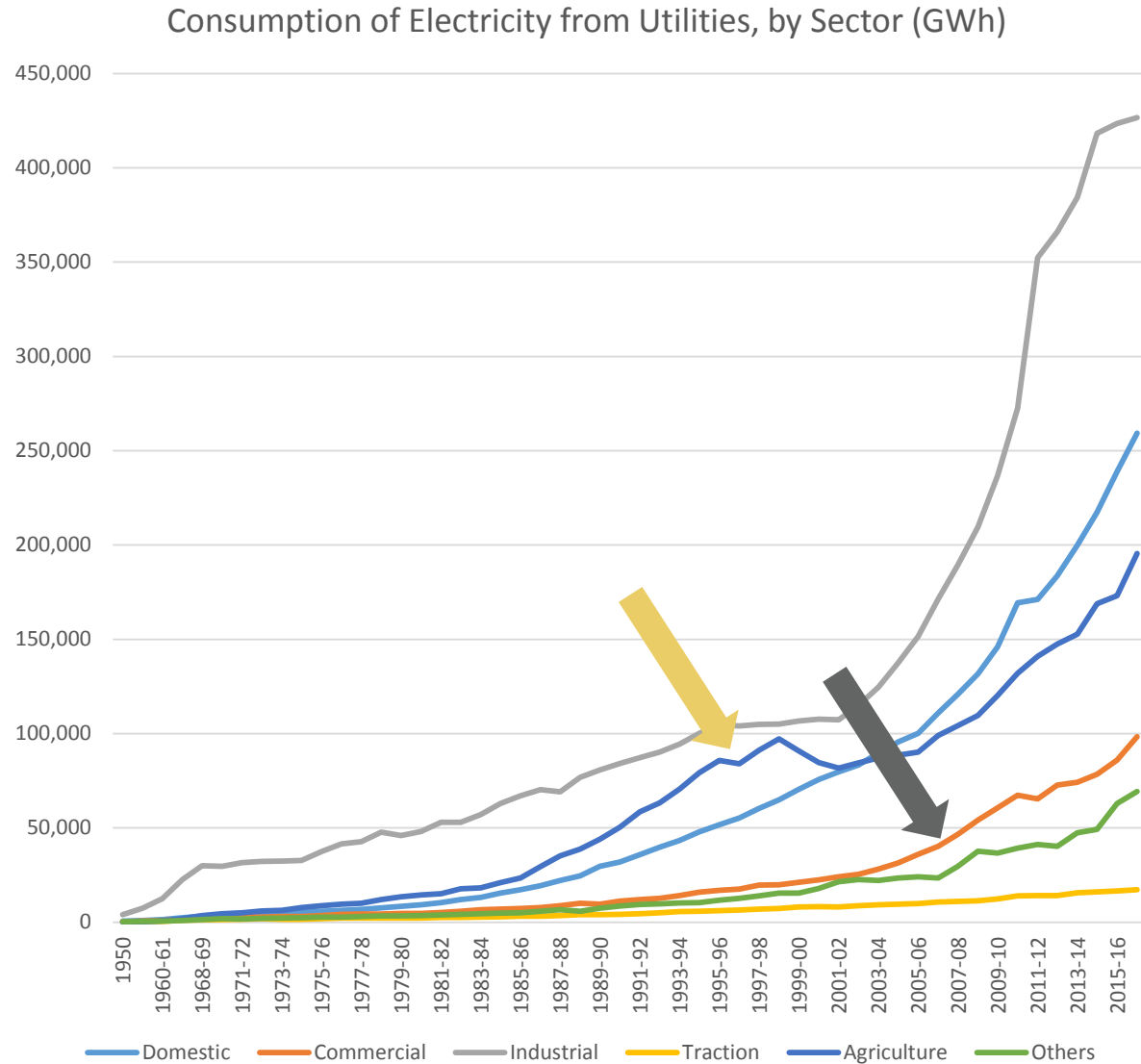
KAPSARC Toolkit for Behavioral Analysis (KTAB)

The Future of India's Energy Sector



Source: MOSPI, CEA, KAPSARC Analysis * Hydro, Nuclear and Renewables

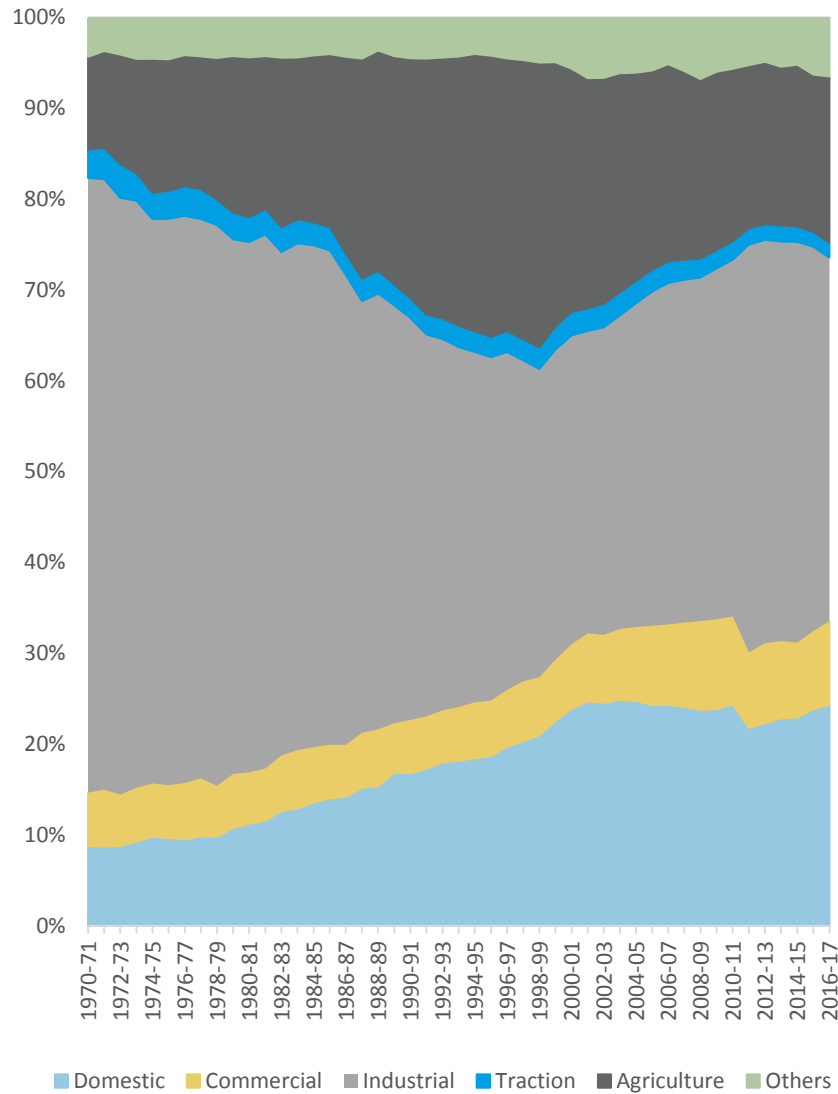
- Coal remains a key energy source for India. Cheap, domestically available and can be priced politically.
- Per Capita GDP has doubled over the past decade, with the expectation that political stability will help it rise further.
- Early promise of domestic gas fizzled out over supply issues. Pricing remains a key aspect. Low domestic prices hampering exploration.
- Oil imports have turned India the third largest importer behind US and China.



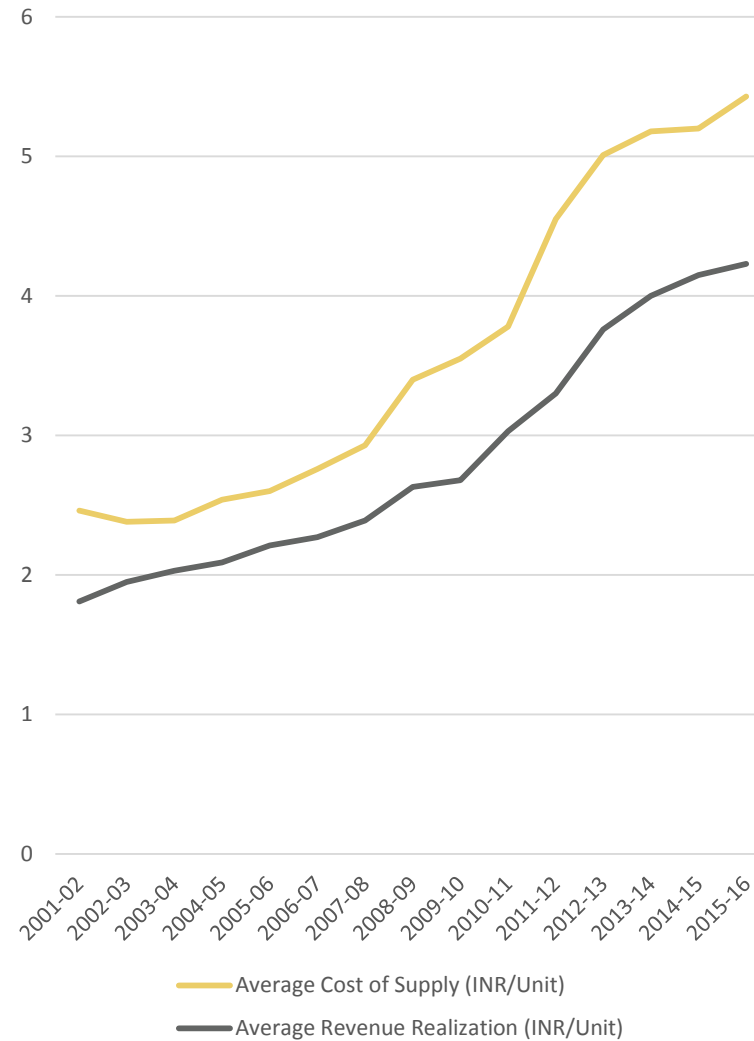
Source: MOSPI, CEA, KAPSARC Analysis

- Electricity sector remains highly susceptible to political influence. Recent policy moves to transition the sector towards reforms are a case in point.
- Political stability critical to the electricity sector as its impacts on the sector, fester for long.
- Changing structure of Indian economy will impact Indian electricity sector. Services sector increased commercial consumption, policy push for manufacturing should incentivize industrial consumption.

Consumption Share of the Sectors (%)



Revenue Gap in Electricity



- Critical to understand Indian energy policies to be able to look at long term reform issues.
- Recent policy measures have focused on turning around the electricity sector.
- Populist missteps have increased banking risks and saddled the sector with multiple challenges.

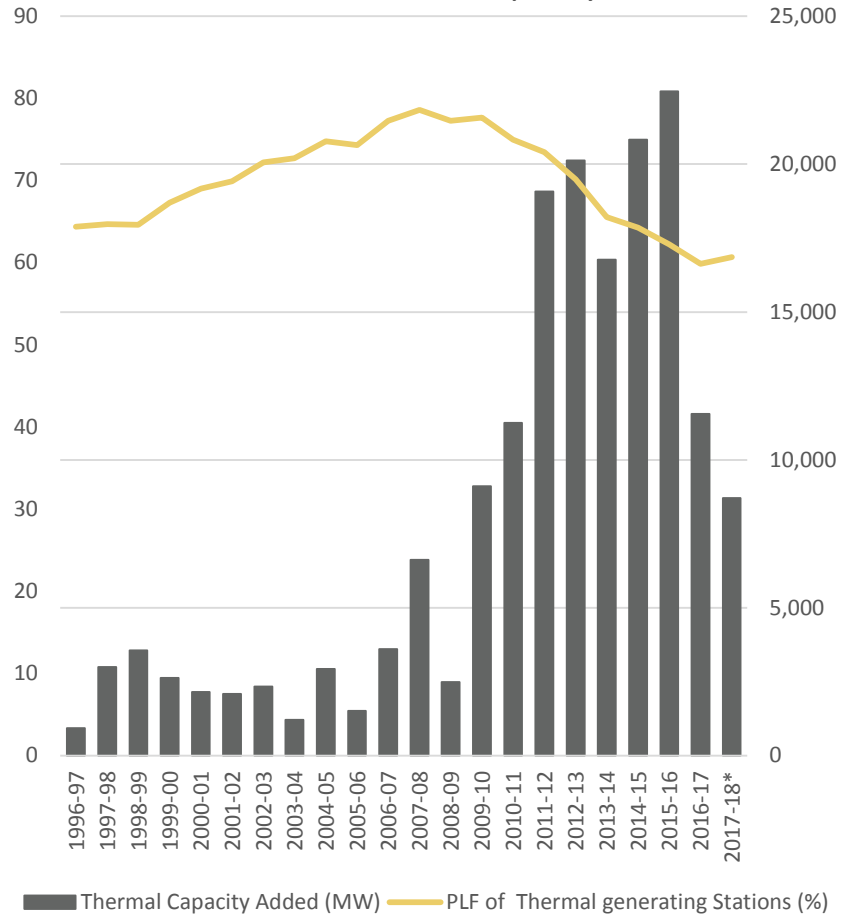
Source: MOSPI, CEA, KAPSARC Analysis

Source: PFC, CEA, KAPSARC Analysis

\$1 = ₹ 67.40

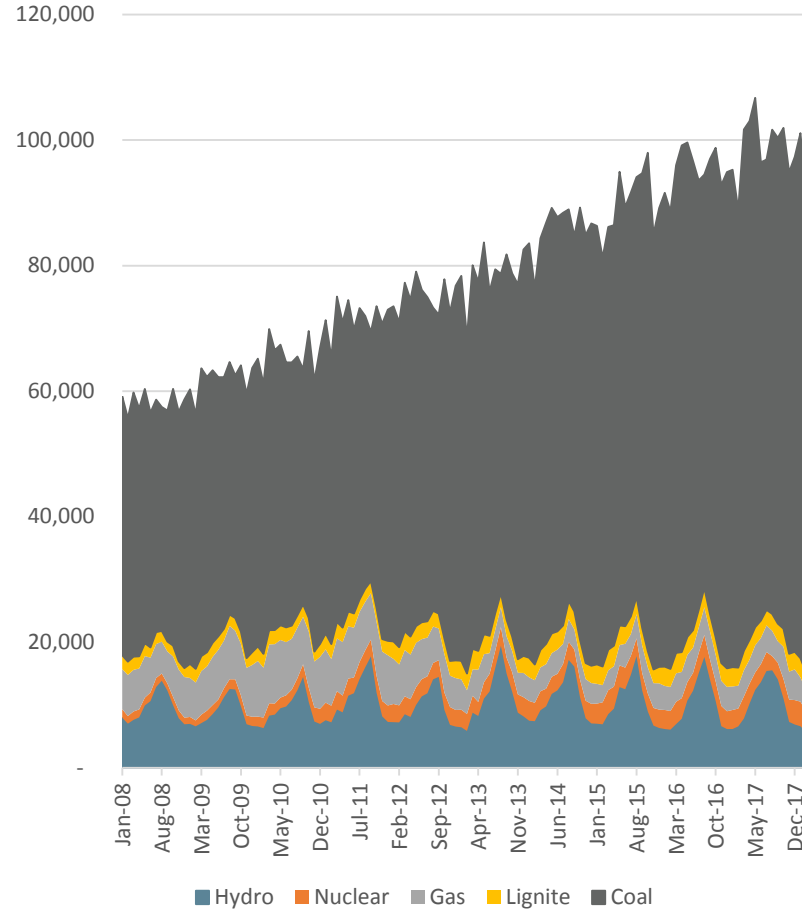
EIA Energy Conference 2018

Utilization and Thermal Capacity Addition



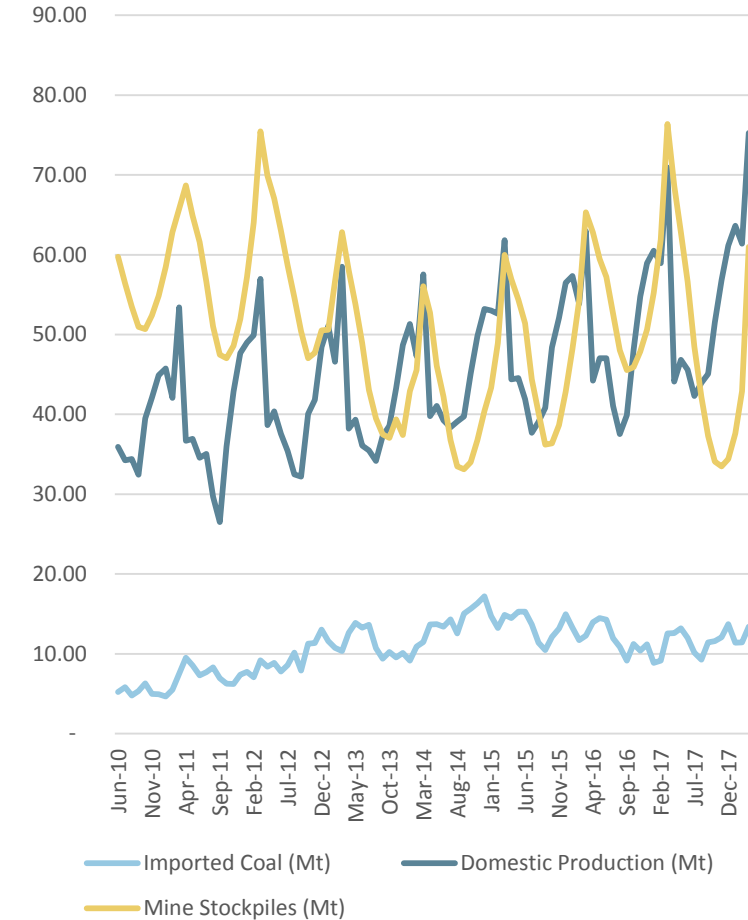
Source: CEA, KAPSARC Analysis

Electricity Generation (GWh)



Source: ICMW, Commodity Insights

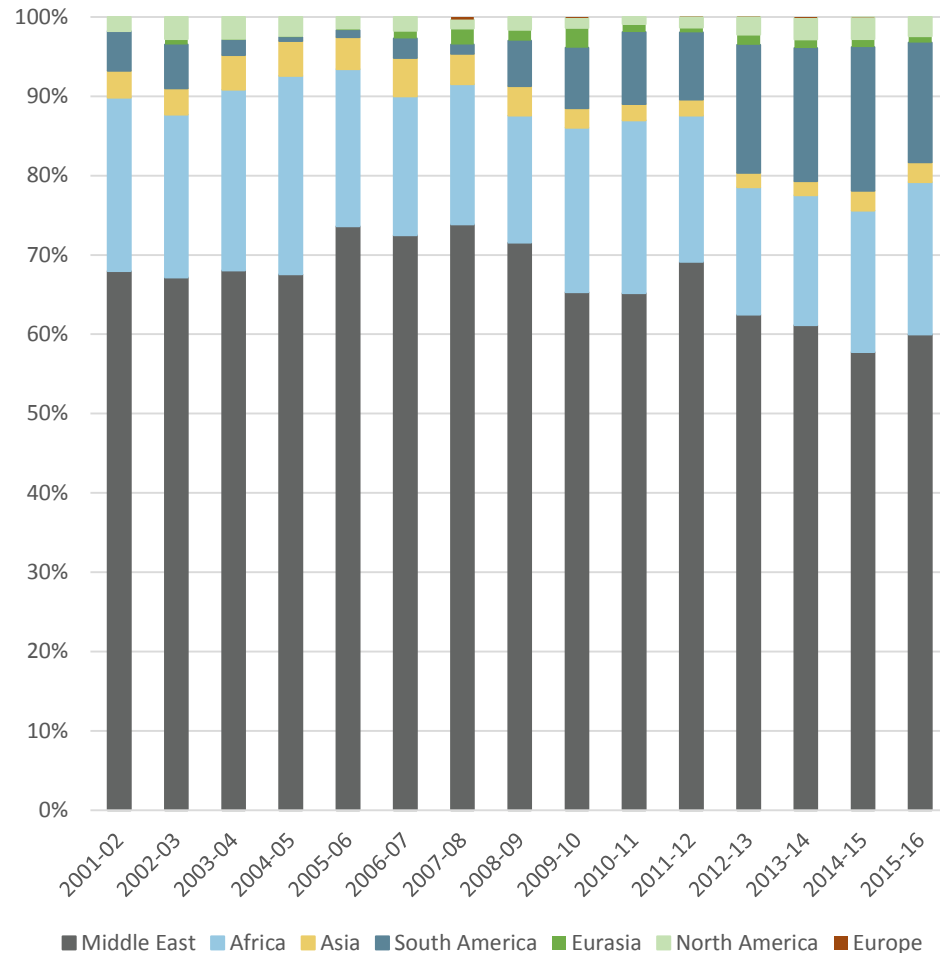
Coal Production and Imports (Million Tons)



Source: CEA, ICMW, Commodity Insights

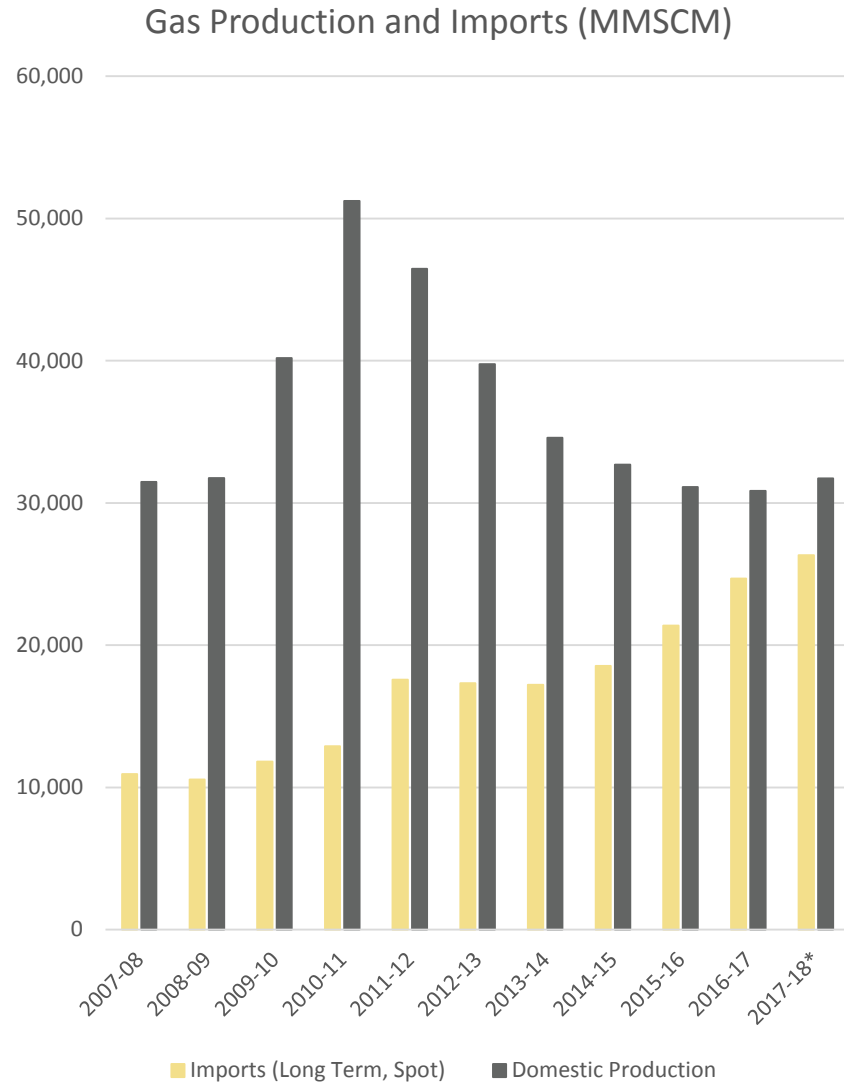
- Revenue issues meant that there was limited resources to invest in capacity expansion.
- Huge build up in a short period has meant that utilizations have fallen and assets have turned non productive impacting several sectors.

Oil Imports - By Source (%)



Source: MoPNG

- Dependent on imports. More 80% of oil consumption is imported. Primarily from Middle East.
- US Crude now being imported into India. Price discounts and need to diversify sources primary reasons along with the political need to cater to US economic concerns.
- Provides an opportunity to balance OPEC’s actions.
- Disruption from EV to Indian oil markets are a bit optimistic currently given the structure of the Indian vehicular fleet. Car ownership still an aspirational draw for a growing middle class, especially from the emerging rural markets.



Source: PPAC, MoPNG

- Imports have more than doubled over the past decade. Low prices, increased availability and willingness of suppliers to renegotiate terms.
- Increased policy focus on clean cooking fuel and city gas projects provides opportunities to increase market depth.
- Higher spending on gas infrastructure and policy reforms in gas sector provides opportunities for growth.
- Domestic policies will provide a direction in terms of pricing and availability.

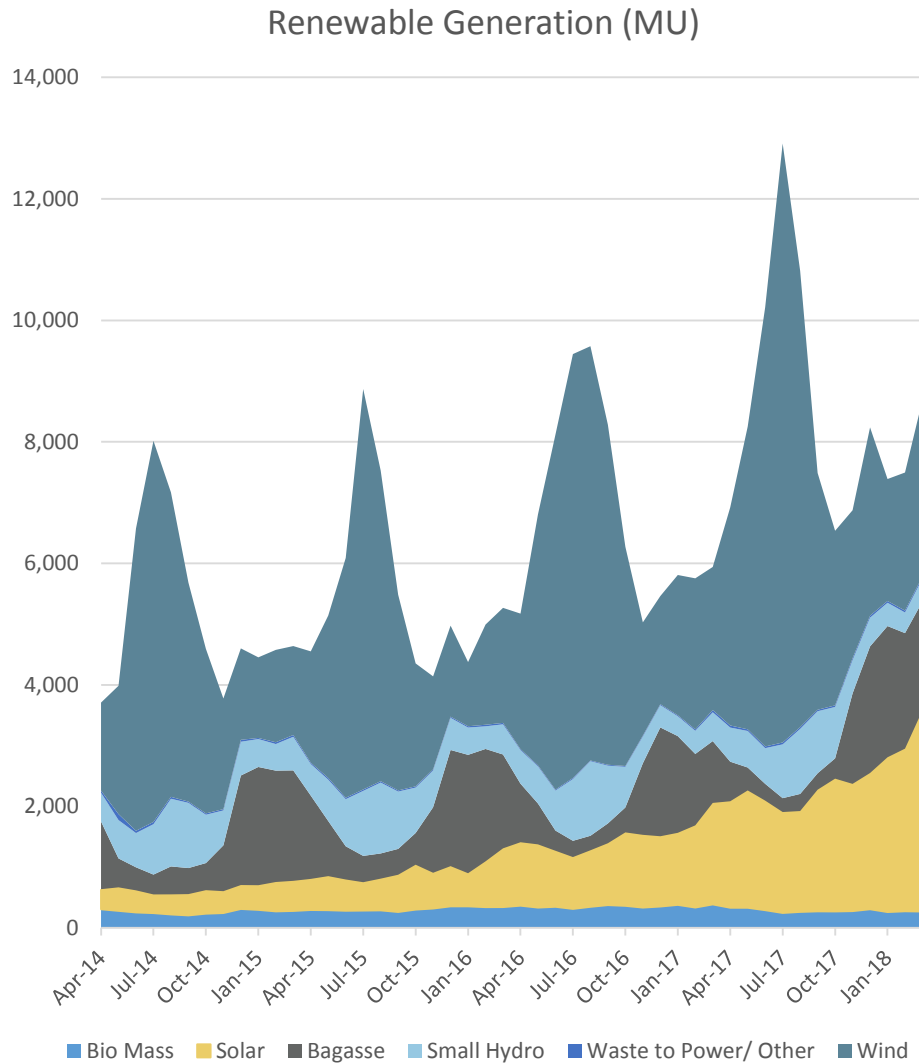
Key Points

- Indian energy economy remains dependent upon imports and its quest for energy security will drive policymaking.
- Growth of Indian energy economy and its impact on global commodity markets remains largely under studied. The growth in petroleum coke exports from US to India is a case in point.
- Indian energy markets are increasingly policy driven and it is important to understand the development of Indian policy making to be able to understand energy transitions and their global repercussions.



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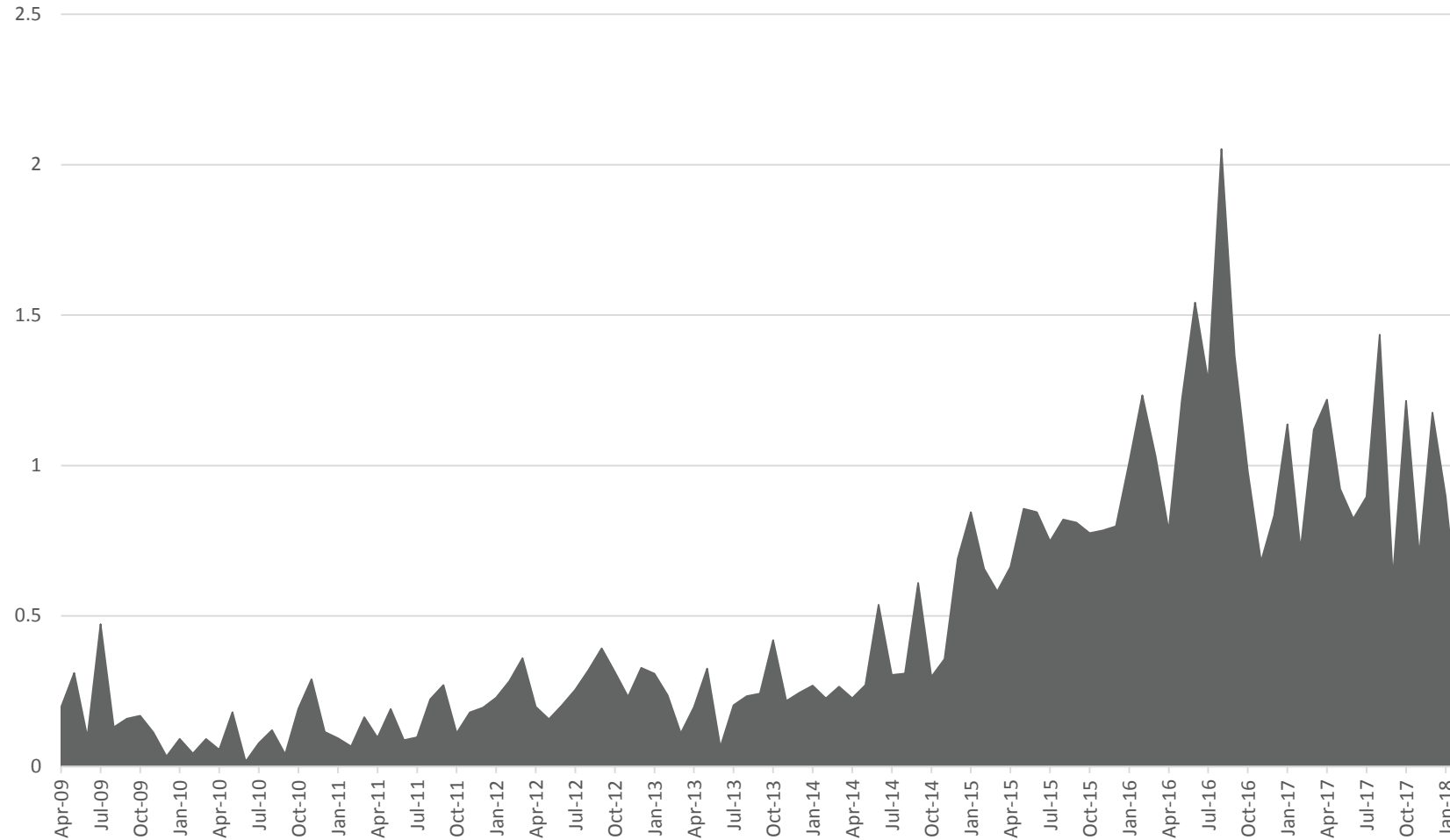
Thank You



Source: CEA, KAPSARC Analysis

- Renewables still in a nascent stage and increase in generation and installed capacity should help in reducing fossil fuels in the electricity mix.
- Challenges are varied from evacuation to grids, curtailment, state of finances of the state utility boards.
- Falling prices increase incentive for utility boards to renegotiate terms.
- A couple of years ago, NTPC was bundling “costly” solar with cheap coal, things have turned around and it’s the opposite now.

Petroleum Coke Imports (Million Tons)



Source: ICMW, KAPSARC Analysis

- Greater availability, volatility, still growth has been slowing down. Policy impacts are visible