

# India's energy transition to mid-century: supporting India's aspirations

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# Four transitions

**1** **TRADITIONAL TO MODERN**  
Fuels, technologies, cost and focus

**2** **RURAL TO URBAN**  
Radical shift in consumption patterns


**3** **INTEGRATION WITH GLOBAL ENERGY MARKETS**  
Deeper partnerships, greater market power

**4** **ENVIRONMENTAL SUSTAINABILITY**  
From marginal to central

# **ENERGIZING INDIA**

Towards a Resilient and Equitable Energy System

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# What's special?

## **VALUE**

Contribution to  
better-rounded debate

## **PERSPECTIVE**

Not prescriptive

## **ENERGY AS A SYSTEM**

Cross-cutting  
challenges

## **TIME HORIZON**

Mid-century

## **CONTENT**

7 different scenarios  
3 modelling techniques  
3 Institutions

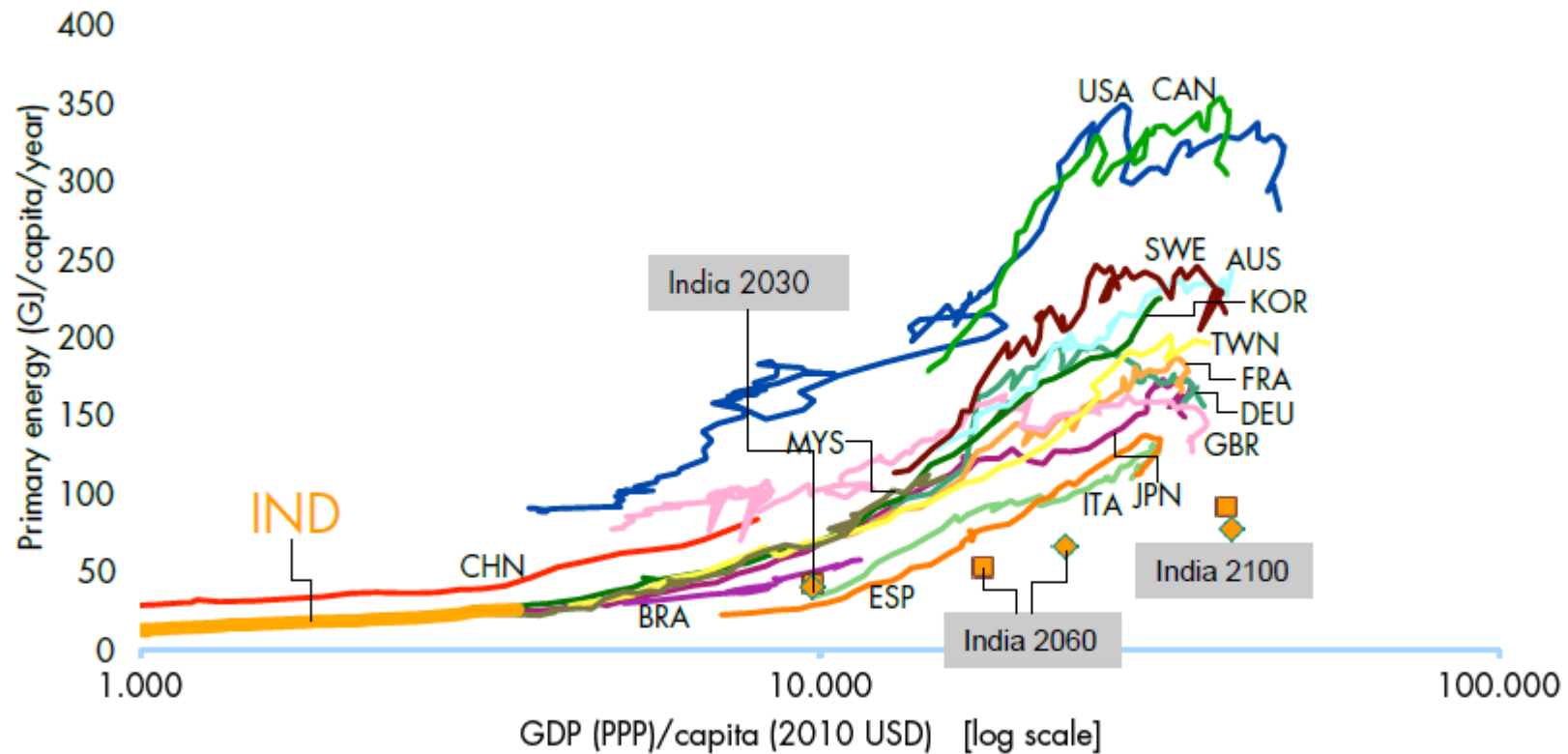
## **AUDIENCE**

Policy aware public,  
not just specialists

# India frugal; needs to remain so

*Figure 1.5.*

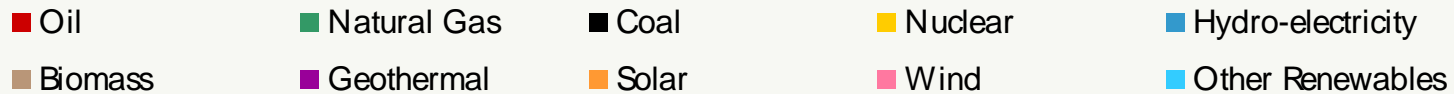
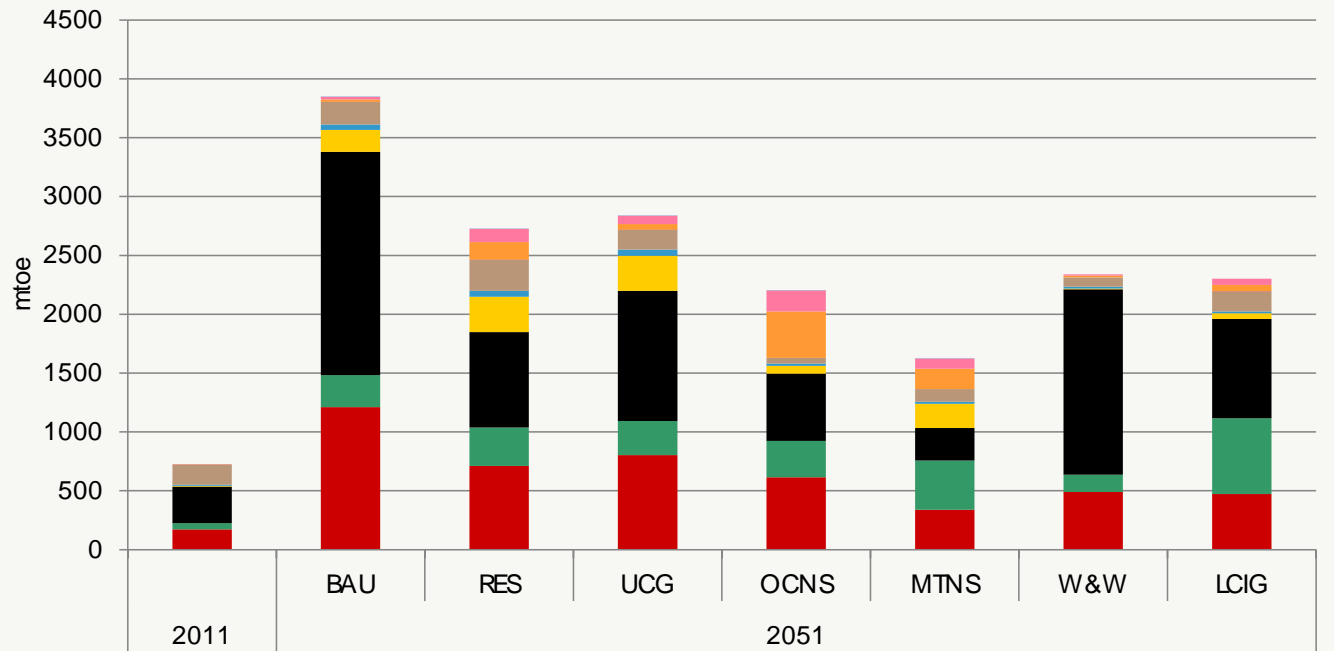
Still on the lower rungs in 2030 and 2050



Source: History—IEA; Outlook—Shell Scenarios.

# Seven scenarios for primary energy

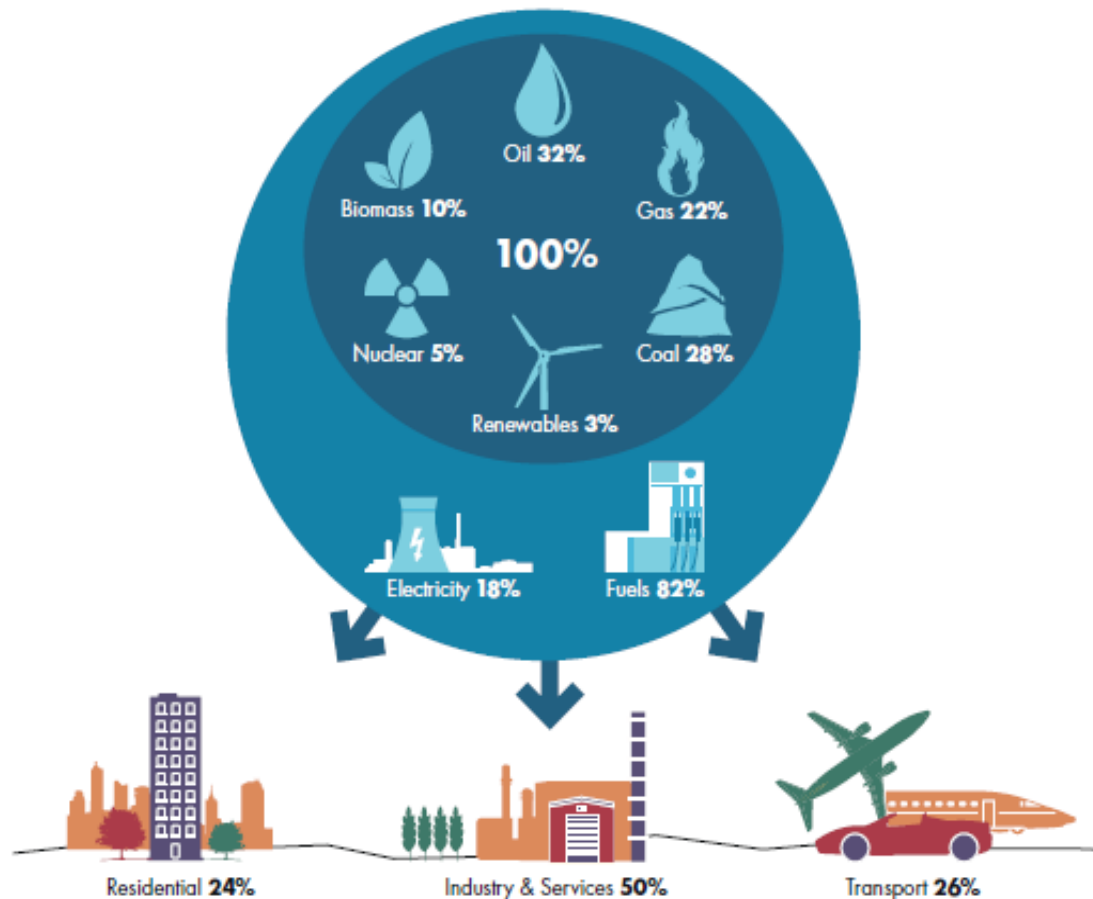
## Total Primary Energy Demand Across Scenarios



# Electricity: 18% today

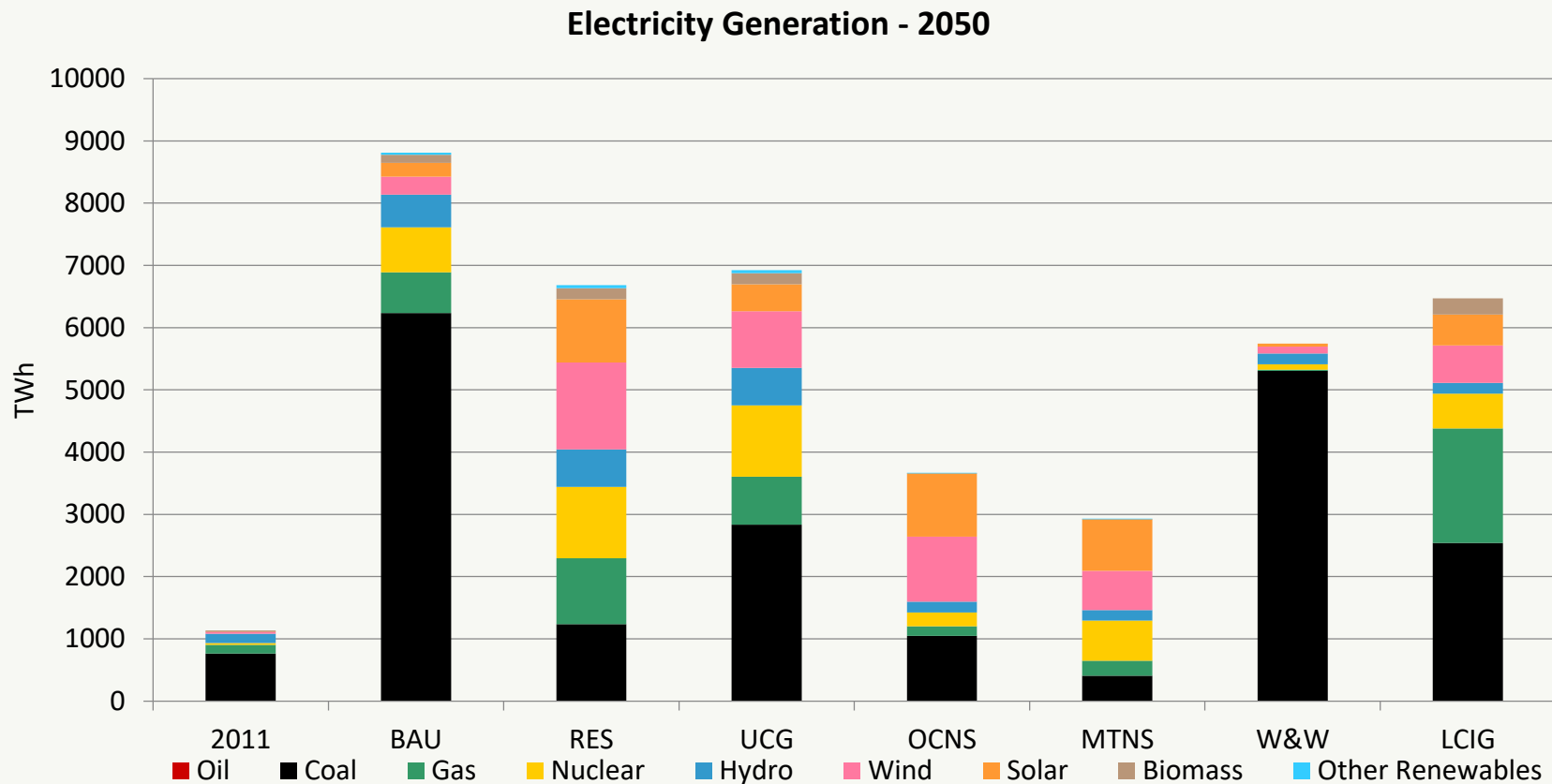
*Figure 1.7.*

From primary energy to carriers and to final use



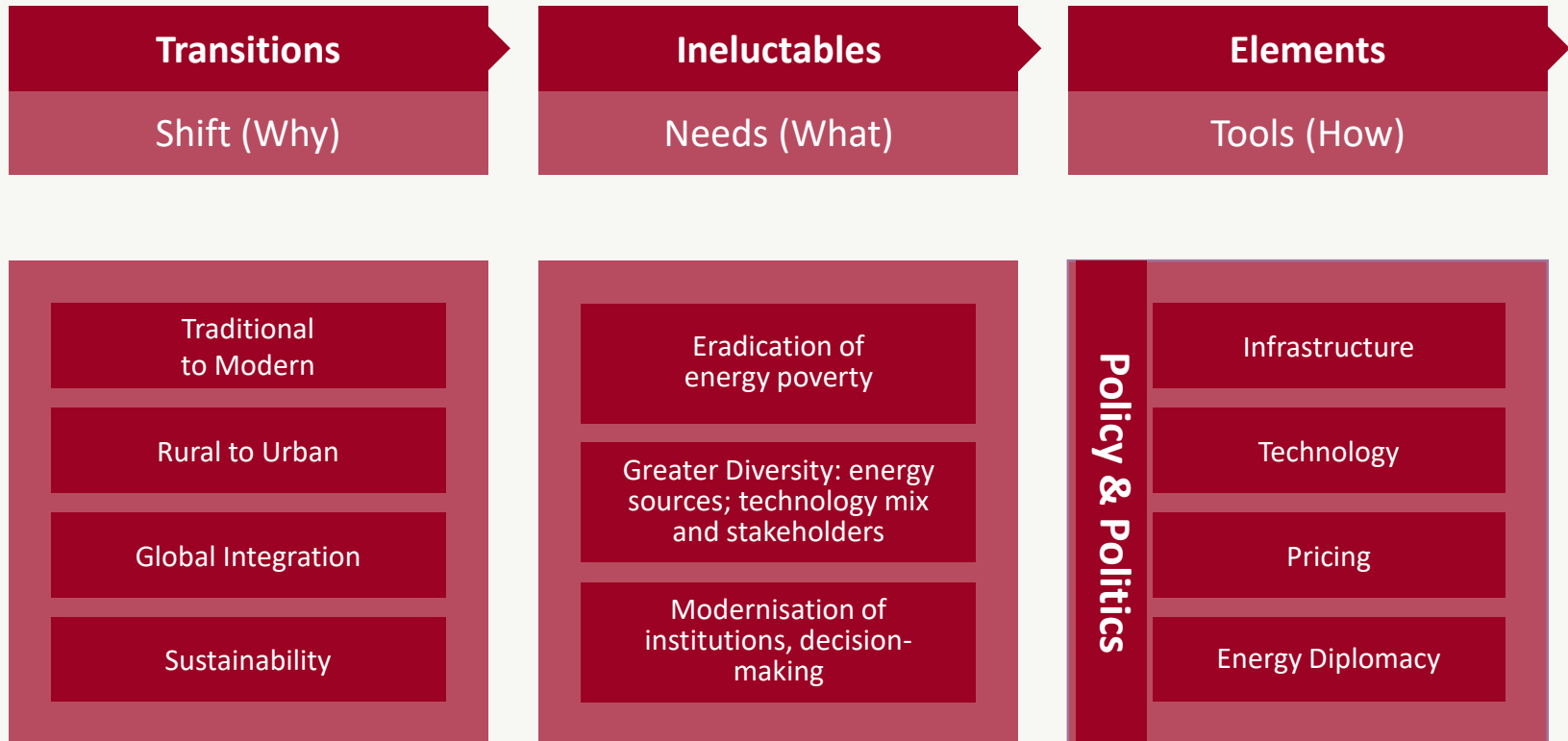
World Energy Demand, 2012. Total primary energy = 556 EJ/year. Total final consumption = 373 EJ/year  
 Fuels (82%) comprise fossil fuels (67%), biomass (12%) and commercial heat (3%)  
 Sources: IEA Extended Energy Balances 2012 and Shell Scenarios Team 2013.

# Fuels for electrification: key policy focus





# 'T-I-E' Framework



# The Tools: Infrastructure, hard and soft

## **'HARD' INFRASTRUCTURE**

Skewed development (especially in gas)  
Overhaul coal transport and align  
with power sector plans

## **'SOFT' INFRASTRUCTURE**

Investment climate for private sector  
More than 50% of the investment in XII FYP  
is from private sector

## **ROLE OF COAL CRITICAL**

Investing in efficient coal infrastructure  
increases yields and reduces risk of  
stranded assets.

## **LEGAL FRAMEWORK**

Impact of existing acts and rules on the  
implementation of projects is serial  
Felt further down the chain (e.g. pipeline  
Issues impact power plant investment)

## **THE CLEAN TRANSITION**

Demand creation by developing the gas  
grid. Creating assets to balance variable  
feed from RE sources is a prerequisite

## **GOVT AS FACILITATOR**

Better regulation through better contracts  
Sanctity of contracts to be respected

## **RISK OF URBAN FORM LOCK-IN**

Reduce reliance on private transport  
Promote alternative technologies in  
transportation

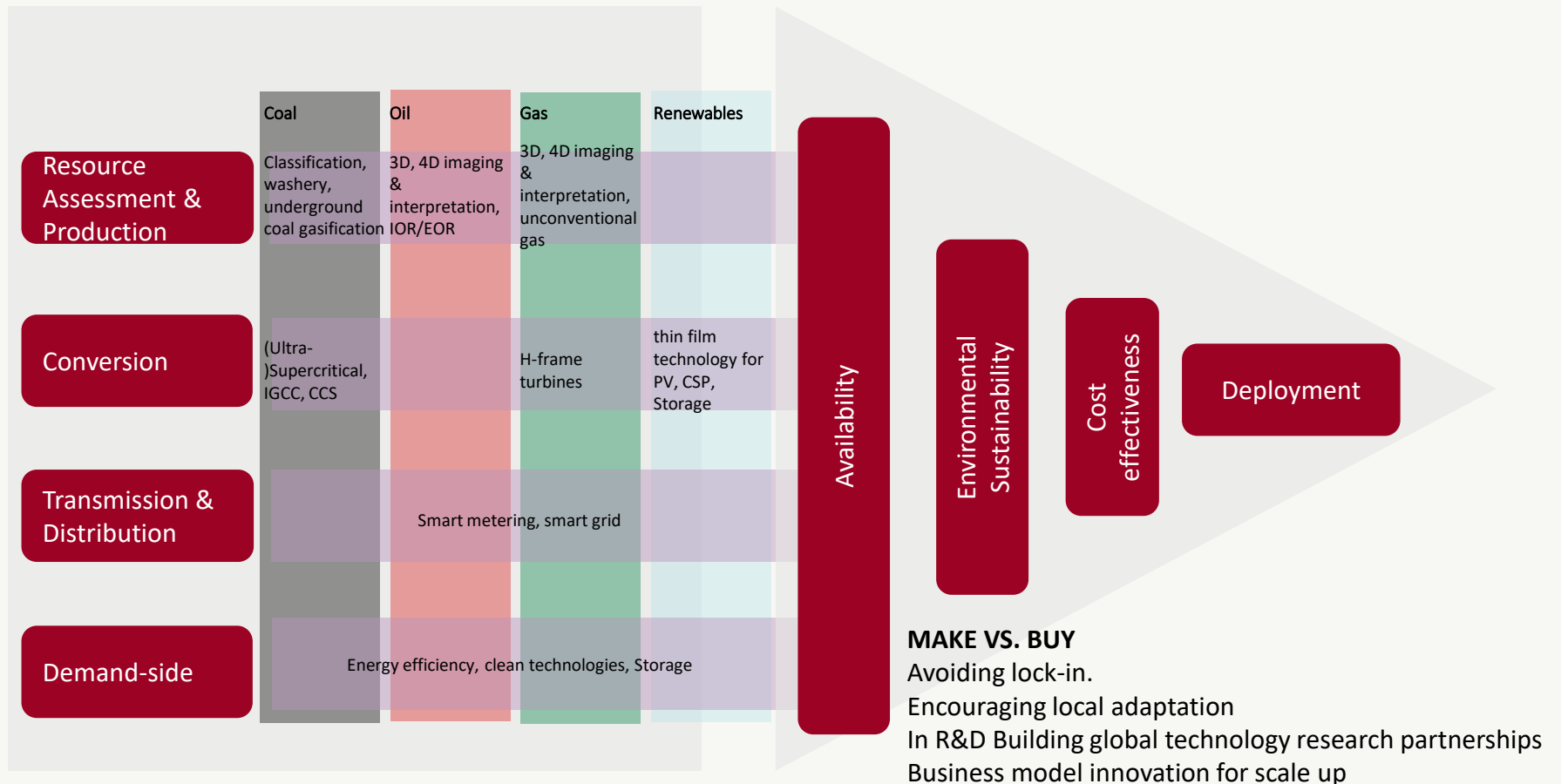
## **UNLEASHING PRIVATE SECTOR**

De-risk investment in energy sector  
Enable bond markets for energy  
Private sector crucial in augmenting skills  
and capacity to deliver

# The Tools: Technology

## NO SILVER BULLET

Technology important on both demand and supply side; Align technical progress and policy environment



# The Tools: Pricing

**Rational Pricing** should promote efficiency of energy use across the whole value chain, internalise true costs and motivate investment in sustainable energy technologies and markets whilst improving the targeting of necessary subsidies.

**MARKET PRICE DISCOVERY**

**STIMULATING PRIVATE INVESTMENT**

**DISCOURAGING EXTERNALITIES**

**IMPROVING SUBSIDY DISBURSAL**

**PROMOTING INTEGRATION WITH GLOBAL MARKETS**

# India and Global Energy Markets

## Energy security is not energy self-sufficiency

A complex quest for **adequate quantities** of energy resources, at prices that are **affordable and predictable**, while minimizing the risk of overseas **supply disruptions** and ensuring **sustainability** of the environment and of the energy system for future generations.

## Focus areas for India

### ASSURED SUPPLY

Developing capacity for energy diplomacy  
Critically evaluate overseas investments

### SAFE PASSAGE

Invest in building fleet capacity  
Strengthen security partnerships in IOR

### SECURE STORAGE

Build domestic storage capacity  
Cooperative arrangements for storage  
Institutional capacity to manage reserves

### FUNCTIONAL INSTITUTIONS

Transparency; dealing with supply shocks;  
collective security; arbitrate disputes;  
pooling resources; sharing best practices

### EXPLOITING MARKET POWER

Moving from a price taker to price influencer.

# Policy and Governance

## ‘RECONCILING ECONOMIC AND POLITICAL RATIONALITY’

- Aligning National, regional, global politics key to successful implementation.
- Also interactions within state system (Union/State/City; Government and Courts).

## CRITICAL INTERFACES

State (Governments, PSUs, Regulators, Courts) with private investor; energy consumer; civil society.

## INDEPENDENT REGULATOR?

Can independent regulators protect the sector from populist considerations and political pressures?

## ELEMENTS OF NEW POLICY FRAMEWORK

- Longer-term horizons
- Stability, coherence and transparency across energy value chains
- Aim for continuous improvement on demand side efficiency
- Transport infrastructure
- Facilitation infrastructure

# Summary

- India's growth, employment and strategic aspirations will all force major changes in the management of its energy system.
- Distrust of markets, imports, private sector by officials and consumers will need to be overcome.
- Stability in policy and regulatory framework essential for private finance.
- What can India learn from Japan?

# Thank you!