

EMERGING POWERS' RENEWABLE ENERGY GOVERNANCE: INDIA

June 21, 2012; Berlin

Towards Energy Security

“We are energy secure when we can supply lifeline energy to all our citizens irrespective of their ability to pay for it as well as meet their effective demand for safe and convenient energy to satisfy their various needs at competitive prices, at all times and with a prescribed confidence level considering shocks and disruptions that can be reasonably expected” (Integrated Energy Policy 2006).

Availability

Accessibility

Affordability

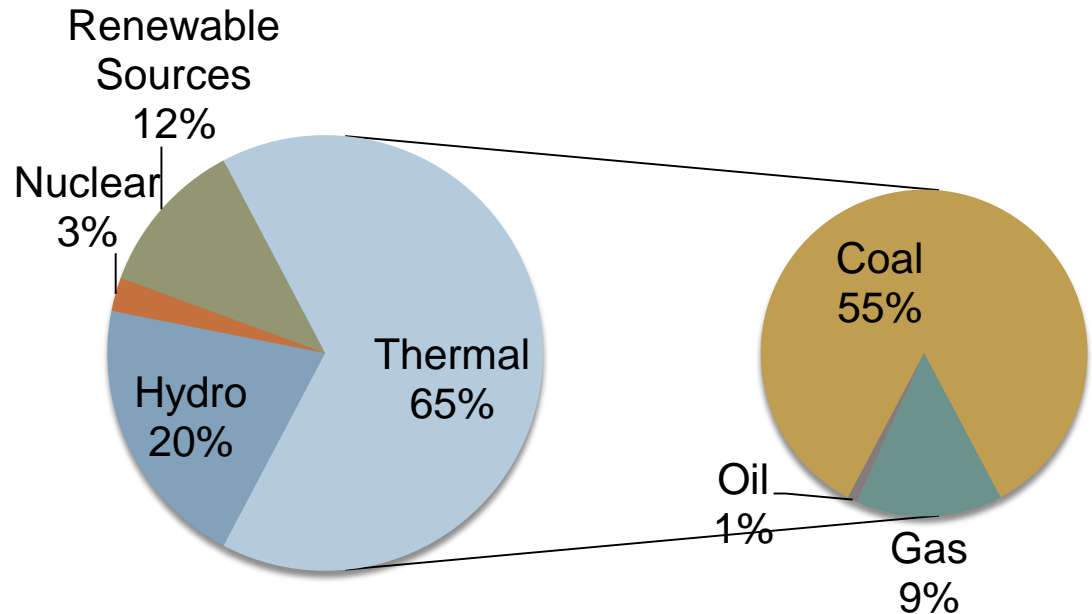
Acceptability

Sustainable energy use highlighted as a policy imperative: NAPCC; Renewable Energy and Energy Efficiency policies; Domestic actions post-Copenhagen

Energy scenario

- Total energy production in India: 502.46 mtoe
- Primary energy consumption: 675.83 mtoe
- Per capita energy consumption: 585 kgoe
- GDP per unit of energy use: USD 5.6/kgoe
- Total installed power generation capacity (as on 30.04.12) is 201637 MW as compared to 147403 MW in 2008.

Installed generation capacity, 2012



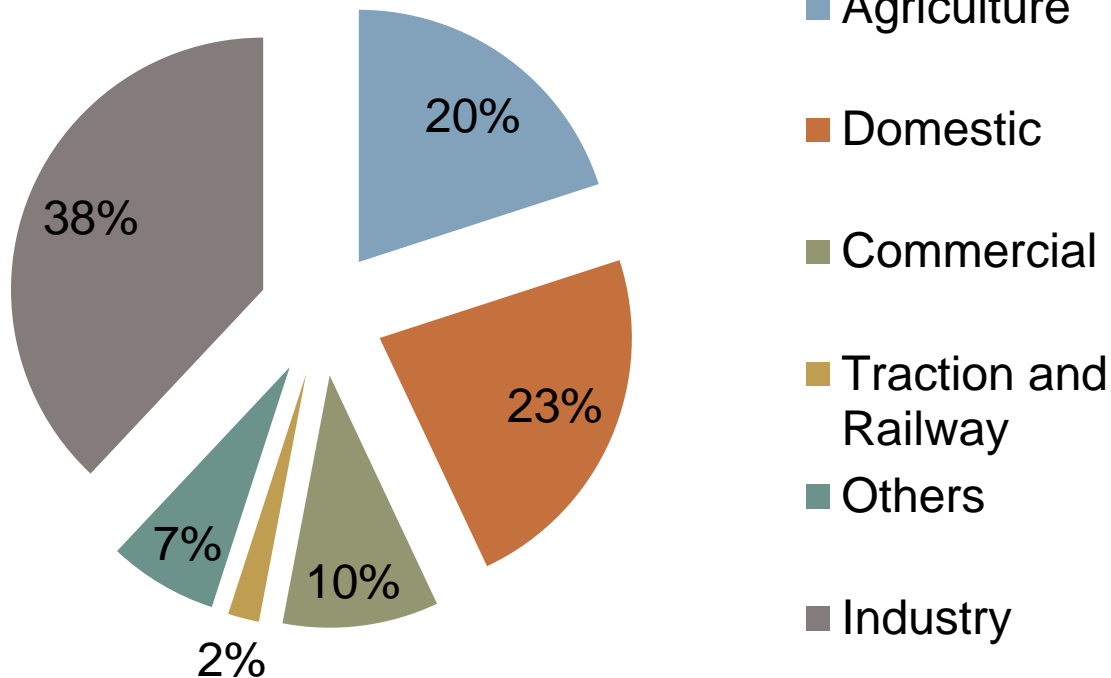
Source: Ministry of Power 2012

... Energy scenario

- In 2010-11, peak power deficit was recorded at 10.3% and total energy deficit was at 8.5%.
- 400 m people in India lack electricity access.
- Intermittent power; seasonal variations.

Consuming sectors

**Power consumption by sector,
2009-10**



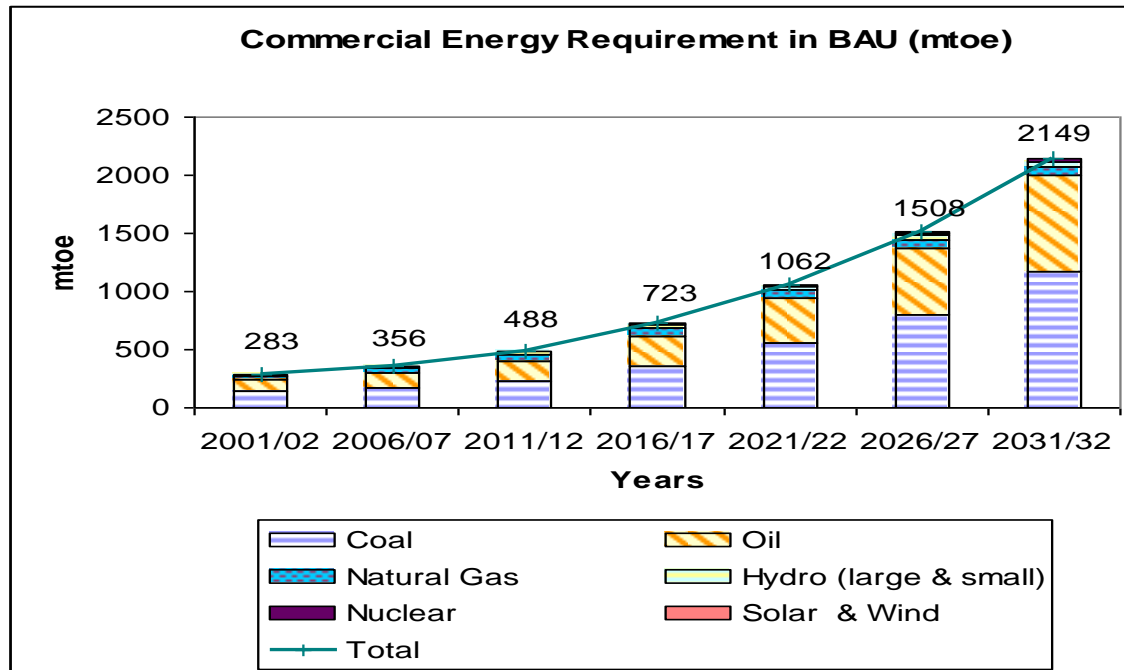
Source: TERI 2012

Fossil fuels' based
captive power
generation:
31,517 MW

The power sector
continues to be
responsible for most of
the increase in
emissions; because of
rapidly increasing
demand for electricity
and because the share
of coal in the electricity
mix is projected to
remain high.

Rationale for RE

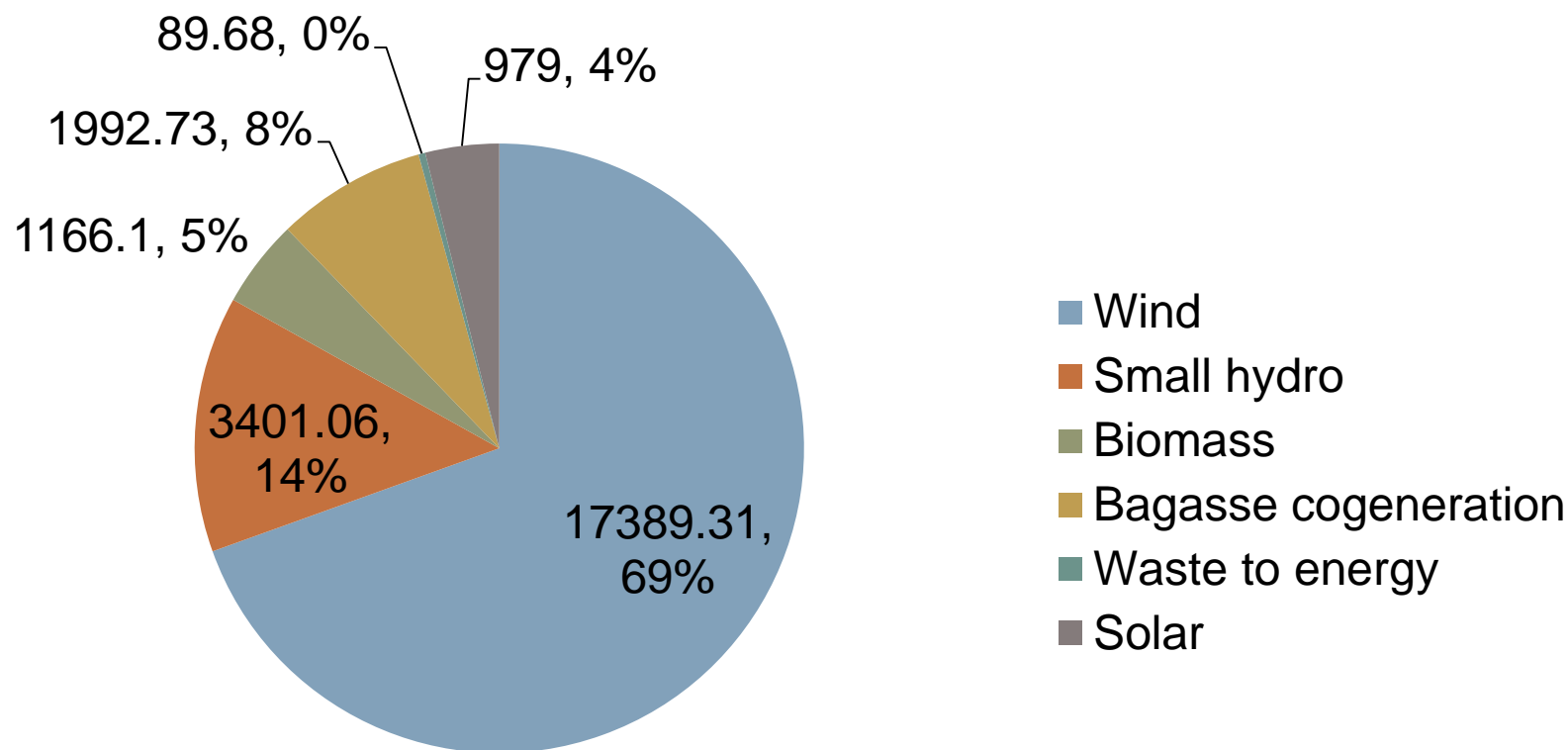
- Increasing strain on conventional sources
- Imperatives of energy security and environmental sustainability
- Lack of access to lifeline energy: decentralised electricity solutions



Source: TERI Analysis

Grid-interactive RE in India

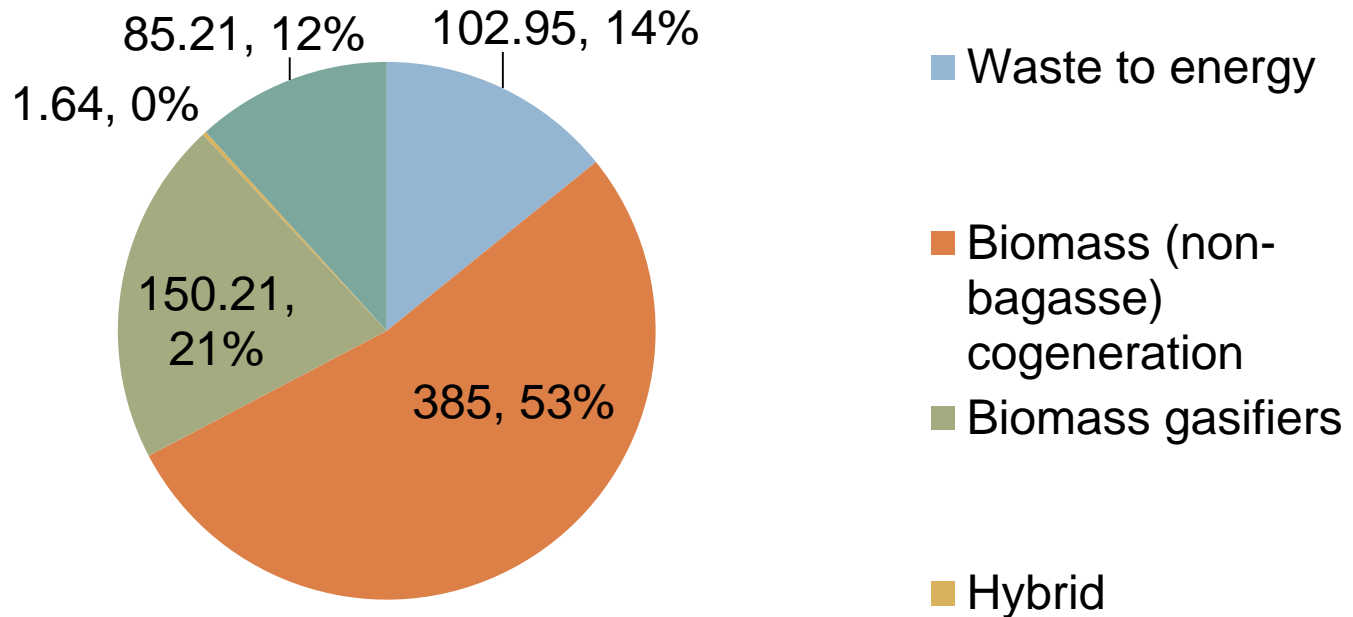
Grid-interactive RE-based Capacity (MW) as on April 30, 2012



Source: Ministry of New and Renewable Energy 2012

Off-grid RE

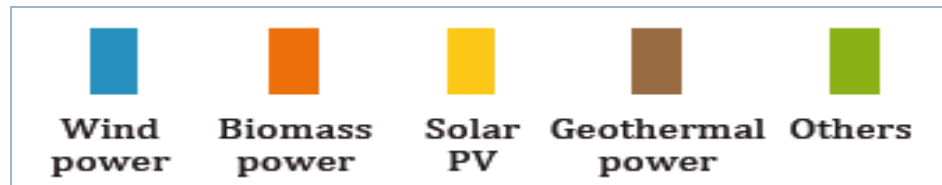
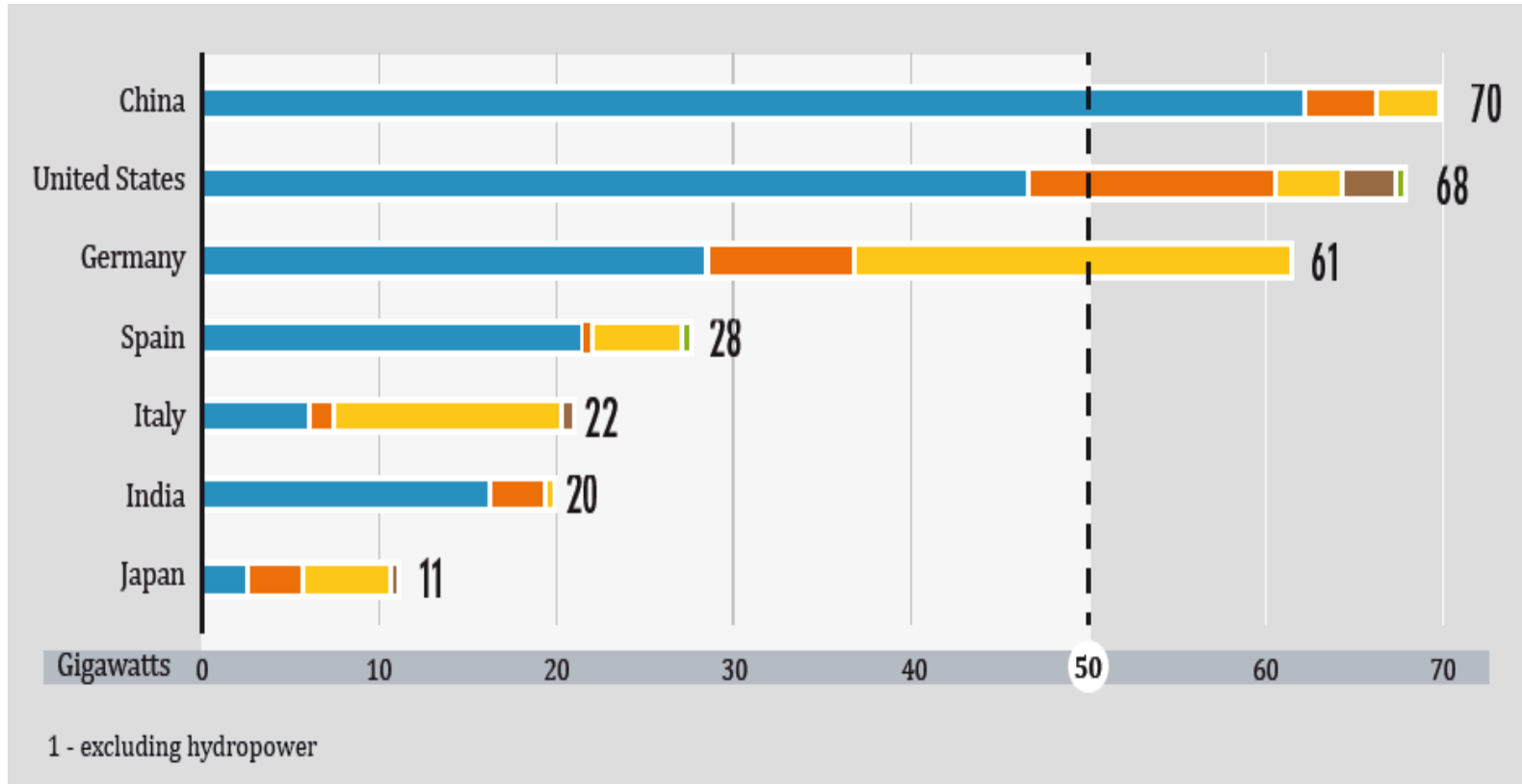
Off-grid RE Capacity (MWeq.) as on April 30, 2012



Source: Ministry of New and Renewable Energy 2012

- Amounting to a total (grid-connected and off-grid) of 25742.89 MW
- Also, exploration of geothermal – Geothermal Atlas of India (GSI, MNRE)

India in the world



Source: REN 21, Renewable Energy Global Status Report 2012

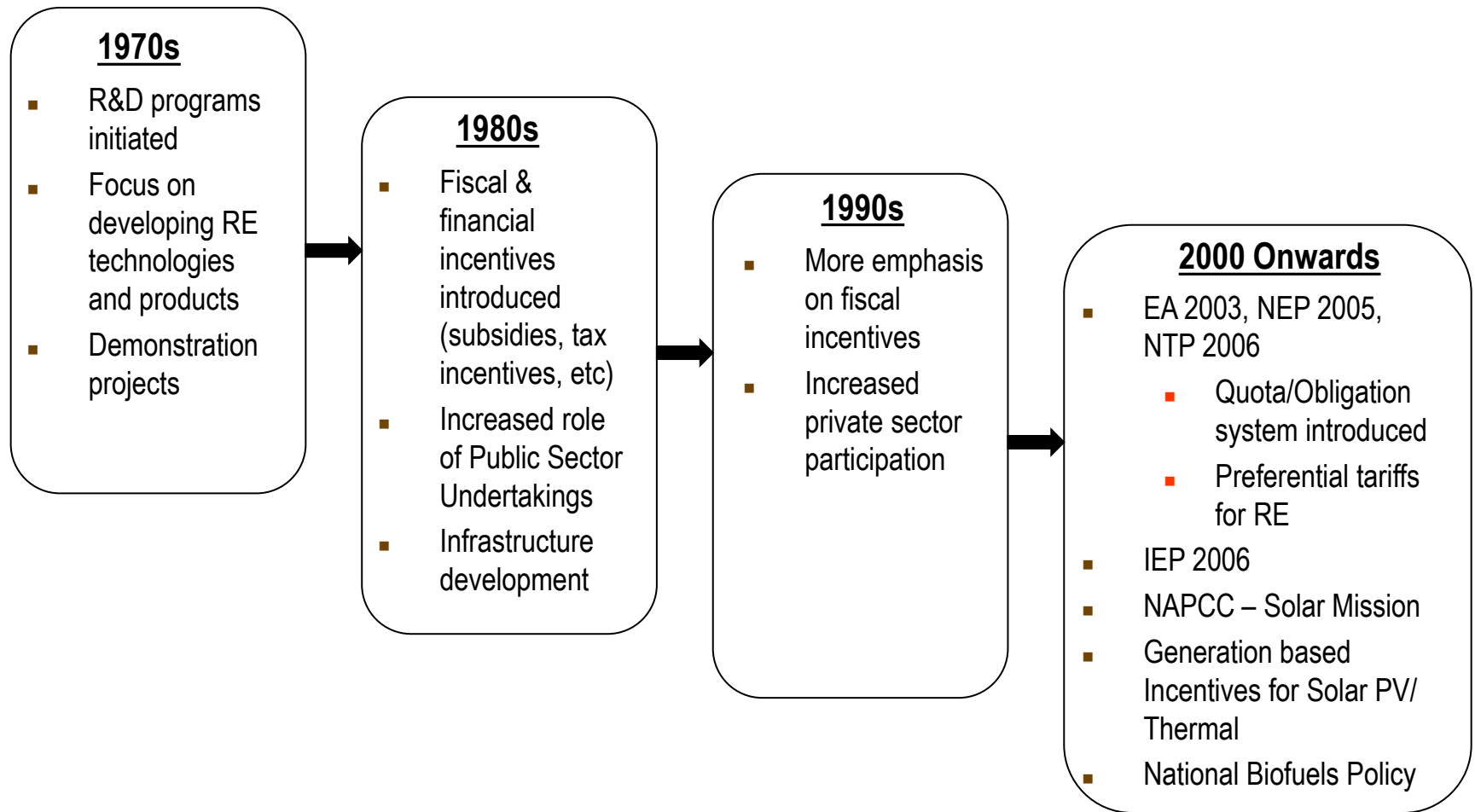
RE Finance

- In India, largest share of asset finance; support from international and bilateral finance; CDM support; IREDA administers federal and international funds; venture capital and commercial financing.
- Barriers in commercialisation: non-availability of funds to defray high upfront costs and market penetration costs; entrepreneurs', and even finance institutions', lack of familiarity with structuring of RE businesses; competition from subsidised conventional energy sources.
- Developing economies that saw the largest investment in renewable energy in 2011 were China, India, and Brazil: China – USD 52 billion (up 17%), India – USD 12 billion (up 62%), and Brazil – USD 7 billion (up 8%).

India's RE policy

- Role:
 - Fulfillment of minimum energy needs;
 - Emphasis on decentralised energy solutions for rural and urban areas
 - Decrease in import dependence and hedge against fossil fuel price volatility
- Policymaking body at the central level: Ministry of New and Renewable Energy (MNRE) – set up as the Ministry of Non-conventional Energy Sources (MNES) in 1992. Was the first ministry in the world devoted to RE.
- Energy institutes: Solar Energy Centre and Centre for Wind Energy Technology; under Ministry supervision.
- Government and multilateral funds for projects: Indian Renewable Energy Development Agency
- Governmental incentives
- Objective: 15% of grid-connected power generation from RE by 2022.

RE policy timeline



Source: TERI analysis, Kumar 2012

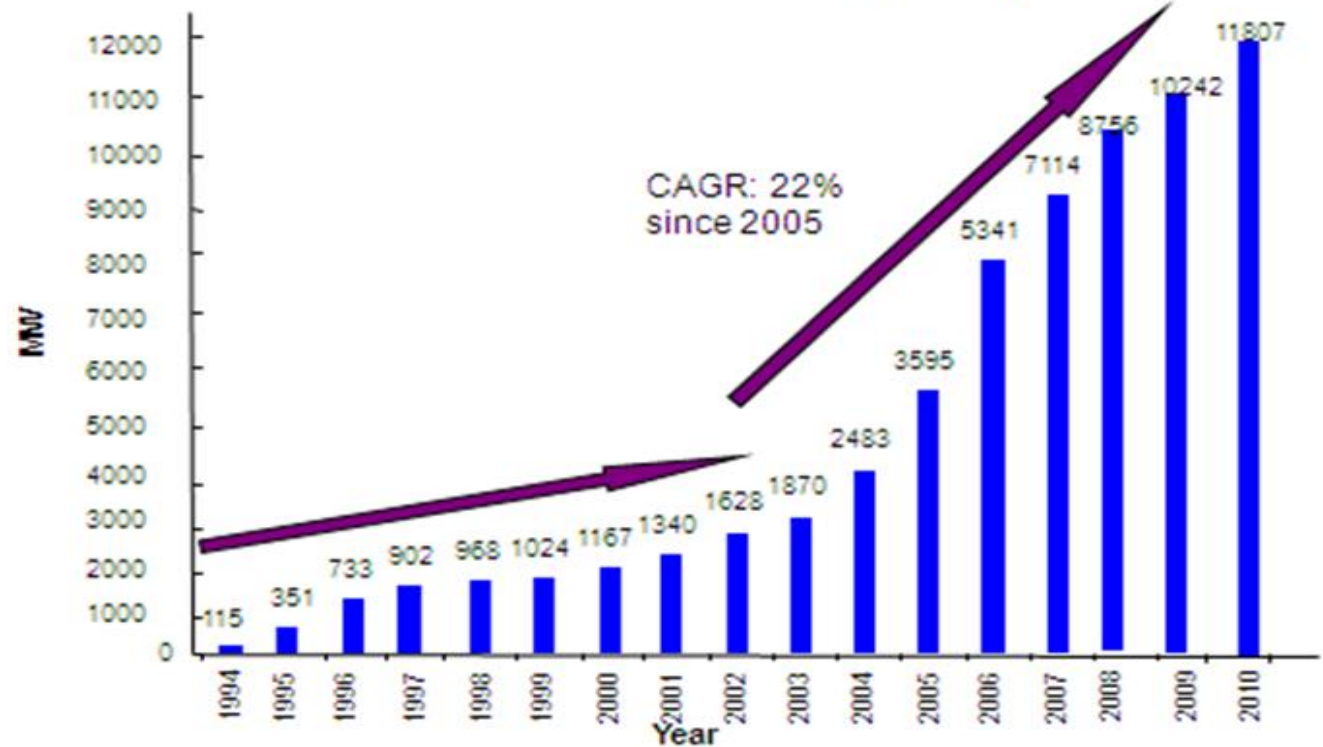
Facilitative policy instruments

Various generation and capacity based incentives are offered:

- Feed-in Tariffs
- Tax benefits – IT holidays, exemptions in duties and taxes
- Investment subsidies
- Low-interest loans
- Quota obligations

Wind energy

Grid connected wind power projects in India: cumulative capacity addition



**Estimated
potential:
48,561 MW**

Source: Kumar 2012

Solar energy

Targets under JNNSM (2022):

- Solar Thermal Collectors – 20 million square meters
- Off-grid solar – 2000 MW
- Grid power incl. rooftops – 20000 MW

About 58% of the geographical area in India potentially represents the solar hotspots in the country with more than 5kWh/m²/day of annual average global insolation.

What is required?

A concerted effort towards:

- further boosting the domestic manufacturing capacity,
- exploring and upscaling all renewable energy options,
- achieving economies of scale,
- providing the policy commitment needed to build confidence in industry and consumers, and
- designing and implementing innovative business models around RE especially for unelectrified pockets.

International governance of RE

RE in international institutions: A range of UN bodies including UNEP, UNFCCC, UNDP; G8; G20; IEA; IRENA; regional organisations; networks such as Global Network on Energy for Sustainable Development (GNESD) and Renewable Energy Policy Network for the 21st Century (REN21); multi-stakeholder partnerships such as REEEP, World Wind Energy Association, and Partnership for Clean Indoor Air (PCIA); voluntary public commitment programs, for instance the International Action Program of the Bonn International Renewable Energy Conference of 2004.

Why: Benefits of RE are well-recognised but resources are under-exploited. RE needs policy support to make its place in energy markets.

International forums are geared towards engaging countries to work on the RE agenda, and indentifying RE goals backed by multilateral commitment.

India's interactions with international RE governance mechanisms

□ IRENA

Proposal for an international RE agency made in 1981 at the UN Conference on New and Renewable Sources of Energy, Nairobi. Concept developed by Eurosolar and other RE organisations. India joined soon after IRENA was founded in 2009.

Development of country-specific knowledge.

November 2011 – Practitioners' Meeting held in IIM Bangalore; focus on business-driven solutions for energy access.

Former Indian Joint Secretary, MNRE, is currently Director, Knowledge Management and Technology Cooperation.

Indian government participation in IRENA events.

... India's interactions

□ **REN21**

Launched in 2005 after BIREC 2004.

Creation of knowledge, interactive information tools, and delineation of policy imperatives

Delhi International Renewable Energy Conference 2010 on 'Upscaling and Mainstreaming Renewables for Energy Security, Climate Change and Economic Development'

Administers the International Action Program or the Renewables Pledge Program. India's 6 pledges at DIREC: clean cookstove technologies, bioenergy applications, wind-solar hybrid systems, windmills, solar installations for lighting and water heating.

... India's interactions

□ REEEP

Established alongside the 2002 World Summit on Sustainable Development in Johannesburg.

400 partners including 45 countries, India being one.

Has financed innovative RE projects in India and supported stakeholders in the RE domain.

In cooperation with REN21, REEEP operates and finances REEGLE – an information gateway on RE and EE

REEEP South Asia Secretariat is housed in the Asian Energy Institute.

... India's interactions

□ **Clean Energy Ministerial**

Major Economies Forum on Energy and Climate was launched in 2009. Beginnings at Copenhagen: first Ministerial announced by US' Steven Chu.

CEMs build on Technology Action Plans of the MEF that lay down “best practice blueprints for action in key technology areas.” Clean energy supply and access, and energy efficiency are focus areas.

Provision of information on RE-related issues and policy tools.

Involvement of private players.

Fourth Ministerial to be held in Delhi in 2013.

... India's interactions

Participation in Clean Energy Ministerial Initiatives

January 2012

	AUSTRALIA	BRAZIL	CANADA	CHINA	DENMARK	EUROPEAN COMMISSION	FINLAND	FRANCE	GERMANY	INDIA	INDONESIA	ITALY	JAPAN	KOREA	MEXICO	NORWAY	RUSSIA	SOUTH AFRICA	SPAIN	SWEDEN	UNITED ARAB EMIRATES	UNITED KINGDOM	UNITED STATES
APPLIANCES (SEAD)	●	●	●		●		●	●	●	●			●	●	●		●	●		●	●	●	●
BIOENERGY		●			●							●								●			
BUILDINGS AND INDUSTRY (GSEP)	●		●		●	●	●	●		●			●	●	●		●	●		●			●
CARBON CAPTURE (CCUS)	●		●	●				●	●				●	●	●	●		●			●	●	●
CLEAN ENERGY POLICY	●							●		●		●	●		●			●		●	●		●
ELECTRIC VEHICLES (EVI)				●	●		●	●	●	●			●					●	●	●		●	●
ENERGY ACCESS (SLED)												●											●
HYDROPOWER		●						●							●	●							●
SMART GRID (ISGAN)	●		●	●		●	●	●	●	●		●	●	●	●	●	●		●	●		●	●
SOLAR AND WIND	●	●			●	●		●	●				●	●	●	●		●	●		●	●	●
WOMEN IN CLEAN ENERGY (C3E)	●				●										●	●		●		●	●	●	●

Non-CEM governments, nongovernmental organizations, and private businesses also participate in selected initiatives.

Source: Clean Energy Ministerial, January 2012

India's interests: Many a right match!

- **Resource mapping and assessment of market potential and policy priorities:**
 - Support may be sought from the Knowledge Management and Technology Cooperation Directorate of IRENA;
 - REN21 and CEM are both involved in assessment exercises.

- **Investment**
 - Development of new finance mechanisms and business models through multi-stakeholder interactions at multiple forums
 - Availability of finance through REEEP

... India's interests

- **R&D, policymaking and capacity building:**
 - Short-term policies to overcome barriers and long-term enabling frameworks that ensure viability.
 - IRENA's Policy Advice and Capacity Building Directorate is relevant here. Capacity Building Expert Meetings have been held to define national priorities.
 - On the basis of its Innovation and Technology Centre (IITC) analyses, IRENA can assist countries in building competencies and developing new financing models.
 - Two-way flows: India is in a position to share technical expertise in solar PV, biomass gasification, manufacture of wind turbines; localised business models
 - Sharing of policy learnings and experience with fiscal measures is key

Cross-cutting issues and institutions

□ **Technology Transfer**

Transfer of low carbon, clean technologies: off-shore wind, solar thermal, large-scale biogas applications.

Barriers: Technologies may not be transferable; lack of market information; high license costs; issues wrt IPR protection.

WTO, UNFCCC.

□ **Climate finance**

Financial mechanisms built under the climate regime

Clean Technology Fund located at the World Bank

Concluding remarks

- India's large RE potential and ambitious policy targets call for strategic interventions.
- Energy security benefits, encompassing energy access, need to be emphasised.
- Knowledge networks and partnerships need to be target-driven.
- Developing countries and developed countries alike need to ensure that the financial downturn doesn't prove a setback for RE. What roles can international institutions play?