

International Support for Domestic Action in Developing Countries

Saturday, June 6th, 2009, 18:00 – 19:30
Side Event at the UNFCCC Meetings in Bonn – METRO Room

<http://www.climatestrategies.org/our-research/category/50.html>

Convened by:
 Climate
Strategies

Agenda

Introduction (Chaired by: Benito Müller)

International Support Mechanisms

- Renewable Energy (Ghana)
- Concentrated Solar Power (South Africa)
- Connecting domestic policy with international support mechanisms
- Discussion

William Gboney

Max Edkins

Heleen de Coninck



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD



MRV

- Energy Efficiency in the Power Sector (India)
- Modal Split of Freight Transport (Brazil)
- The Role of Policy Indicators
- Discussion

Anoop Singh

Márcia Valle Real

Karsten Neuhoff



UNIVERSITY OF CAMBRIDGE
Electricity Policy
Research Group

 Federal Ministry
for Economic Cooperation
and Development



gtz

iisd
International
Institute for
Sustainable
Development
Institut
international du
développement
durable

International Support for Domestic Climate Action

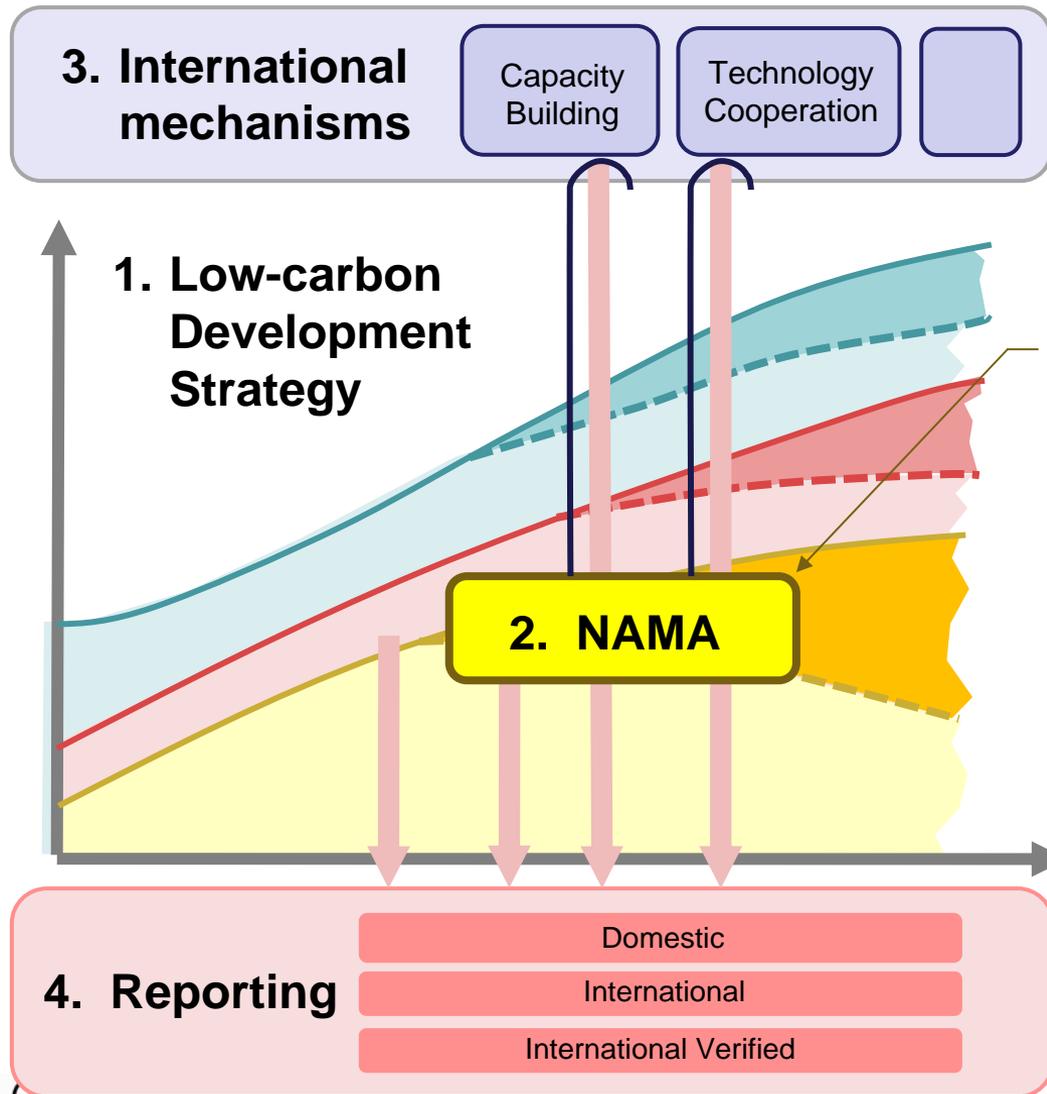
Karsten Neuhoff

Haroldo Machado Filho, Anoop Singh, Xiliang Zhang, William Gboney, Marcia Valle Real, Max Edkins, Heleen de Coninck, Aaron Cosbey, James Cust, Sarah Lester, Tim Laing, Adam Rysanek, Simone Cooper

<http://www.eprg.group.cam.ac.uk/isdcp-phase-ii/>



Using insights from policy studies in India, Ghana, Brazil, China and South Africa to explore:



- How to access?
- Type of support provided?
- Multilateral/bilateral?

- Detailed actions required?
- Domestic drivers & barriers?
- Engagement of private actors?
- Needs for international support?

- Objective of reporting?
- Type of indicators?

INTERNATIONAL SUPPORT FOR DOMESTIC ACTION

Country Case Study on Ghana

by

William Gboney

**(International Institute of Infrastructural Economics
and Management, Accra-Ghana).**

in

Bonn, Germany.

June 5, 2009.

1.0 Project Summary

1. Summary of phase 1:

- Objectives
- Policy Description: Policy and Regulatory Framework
- Domestic Barriers and Drivers

2. Phase II

- Objectives
- Phase II including highlights from Accra workshop
- International support for enhancing scale, scope and speed of implementation,

2.0 Summary: Policy Description

Overall Policy:

- Removing the barriers for RE development and build local capacity; Strategic National Energy Plan by **Energy Commission**
- Enhance Energy Efficiency through DSM – **Energy Foundation**

Examples:

- Achieve at least 10% RE in overall energy mix by 2020- **overall policy (Ministry of Energy)**
- Increase thermal plant efficiency – **Power Utility Company**
- Energy efficiency in energy intensive industries by **Energy Foundation**
 - Energy Audits
 - Power factor enhancement projects
- (d) Energy efficiency labelling and standards by **Energy Foundation and Standards Board.**
- (e) RE law Establish policy, legal and regulatory frameworks to promote grid-connected and off-grid systems- **Energy Commission and Public Utilities Regulatory Commission (PURC)**

3.0 Key Domestic Barriers

(a) Policy Barriers:

- Lack of coherent and comprehensive policy.
- Absence of all-inclusive rural electrification policy

(b) Legal and Regulatory framework:

- Lack of appropriate legal and regulatory frameworks, poor pricing framework
- Lack of knowledge on regulation of mini grids

(c) Financial:

- Lack of access to long-term credit

3.0 Summary of domestic barriers – Cont'd.

- (d) Market risk: For mini-grids, inability of rural customers to pay the tariff

- (e) Weak domestic capacity of local stakeholders:
Example: Capacity to undertake O&M.

- (f) Lack of information and stakeholder awareness

- (g) Limited scope of operations of Energy Foundation

4.0 Domestic Drivers

- Creating an ***enabling domestic environment*** e.g. regulatory and legal frameworks, human and Institutional capacity building etc.
- Development of technology performance standards
- Need to develop innovative financing schemes
- Academics, policy makers, business community
- Public awareness and establishment of information/innovation centres

4.0 Actions and Mechanisms for International Support

(a) Technical Assistance:

- (i) Legal, policy and regulatory frameworks are not limited to only conventional energy sources.
- (ii) Lack of model Power Purchase Agreement for small RETs (<10MW)- avoid ad hoc approach
- (iii) Re-definition of country's rural electrification policy

(b) Capacity Building: Human and Institutional

- (iii) Policy-makers and regulators: Capacity to regulate
- (iv) Capacity to undertake O&M
- (v) Capacity to adopt/adapt and ensuring sustainability

4.0 Actions and Mechanisms – cont'd

(c) Financial Support to RE & EE.

- Taking advantage of Ghana's well-developed financial sector
- Currently: **25 banks** with a total of over **300 branches country-wide.**
- Rural and community banks scheme: Apex Banks and participating rural banks: Support to **129 rural and community banks**
- Taking advantage of government's existing micro-financing scheme to support mini-grid and stand-alone systems
- Support for extension of existing **15-20 months** loans repayment period by rural banks, to at least **5 years.**

4.0 Actions and Mechanism Cont'd

(d) Innovation centre and centre of excellence

idea:

- to bridge the gap between ***academic research and policy-making***
- Enhance technology “leapfrogging”
- Increase information dissemination
- Educate builders and architects on RE and EE concepts in new building designs.
- What is the appropriate process for operationalising it??



Large-scale rollout of Concentrating Solar Power in South Africa

Max Edkins

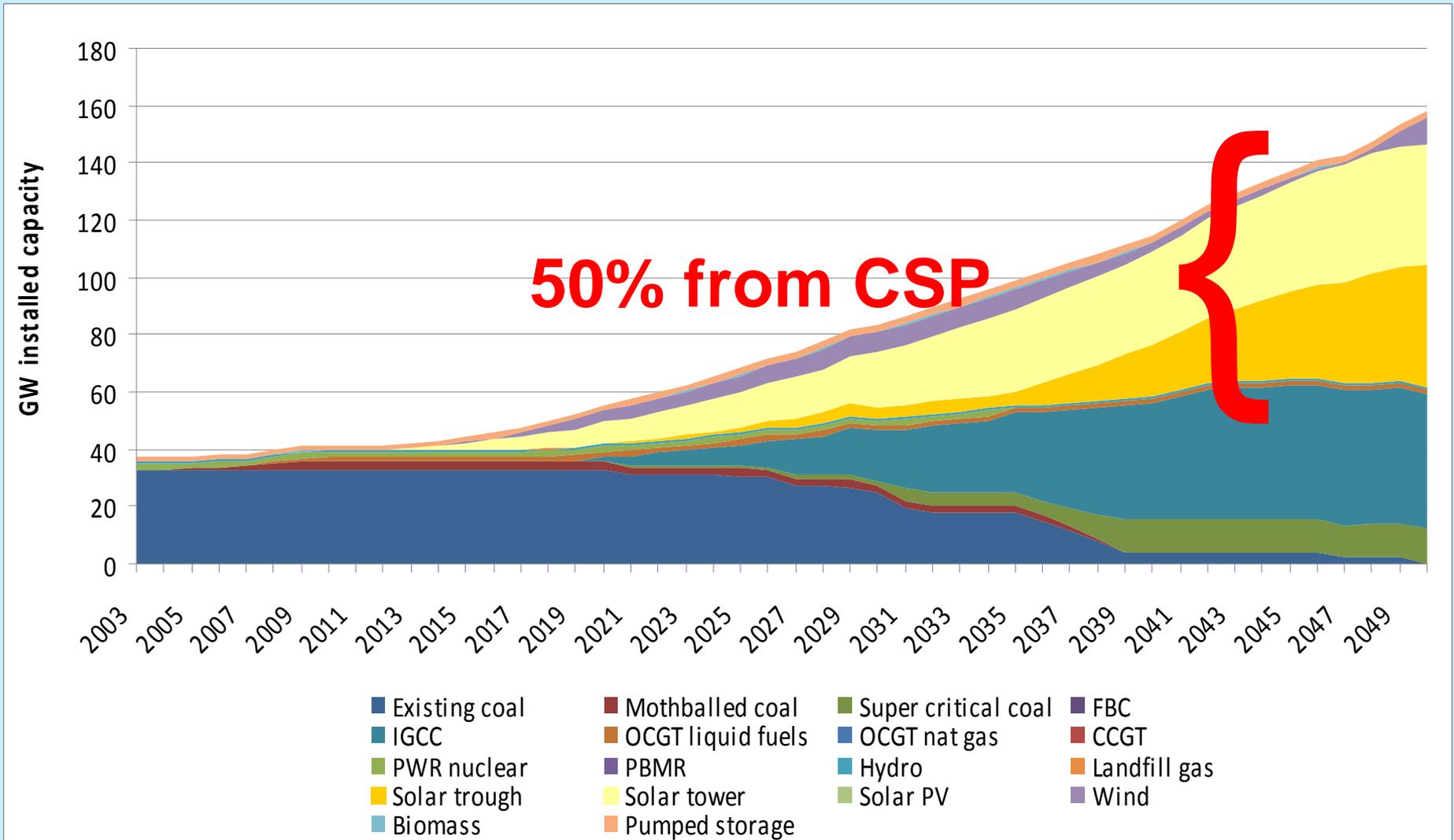
Climate Strategies Side Event • Bonn • 6 June 2009

Energy Research Centre



University of Cape Town

LTMS renewables extended electricity projection



Source: ERC 2007

Global CSP developments

Nevada Solar One (2007)



© Acciona

Andasol 1 (2009)



© Solarmillennium

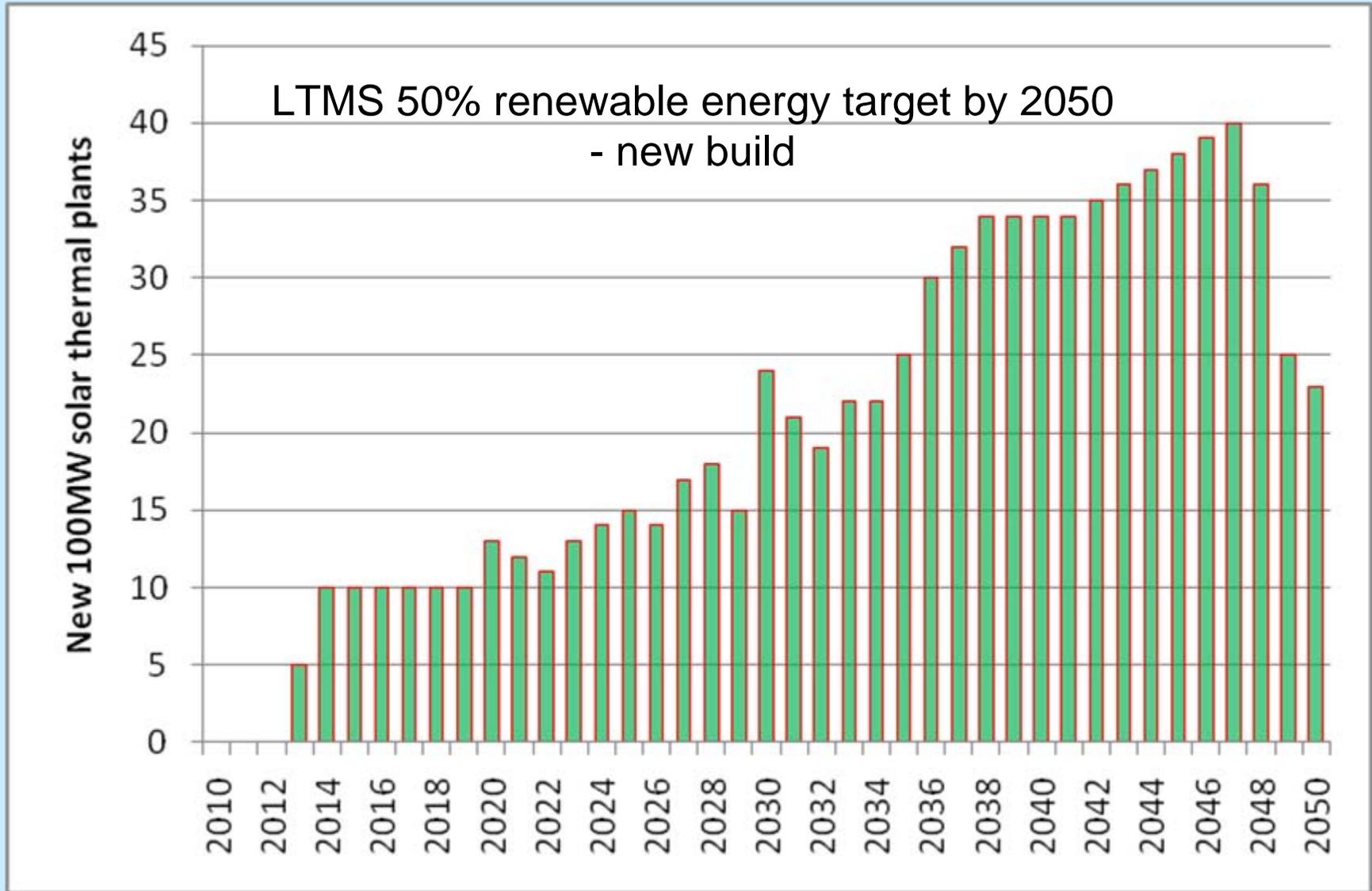
PS 10 (2007) & PS 20 (2009)



© Abengoa



Quantifying - what is large-scale CSP rollout?



Source: ERC 2008

Quantifying - CSP Costs

Nevada Solar One

- > Built by Acciona in Nevada/USA
- > 64 MWe
- > no storage
- > Solar field: 375'000 m²
- > **Invest: ≈ 266 M\$**

= 2.4B ZAR/64 MW
= 3.75B ZAR/100 MW



© Acciona

Andasol 1

- > Built by ACS / Flagsol in Andalucia/Spain
- > Power 50 MWe
- > 7 hours salt storage
- > Solar field: 510'000 m²
- > **Invest: ≈ 300 M€**

= 3.9B ZAR/50 MW
= 7.8B ZAR/100 MW



© Solarmillennium

PS 10

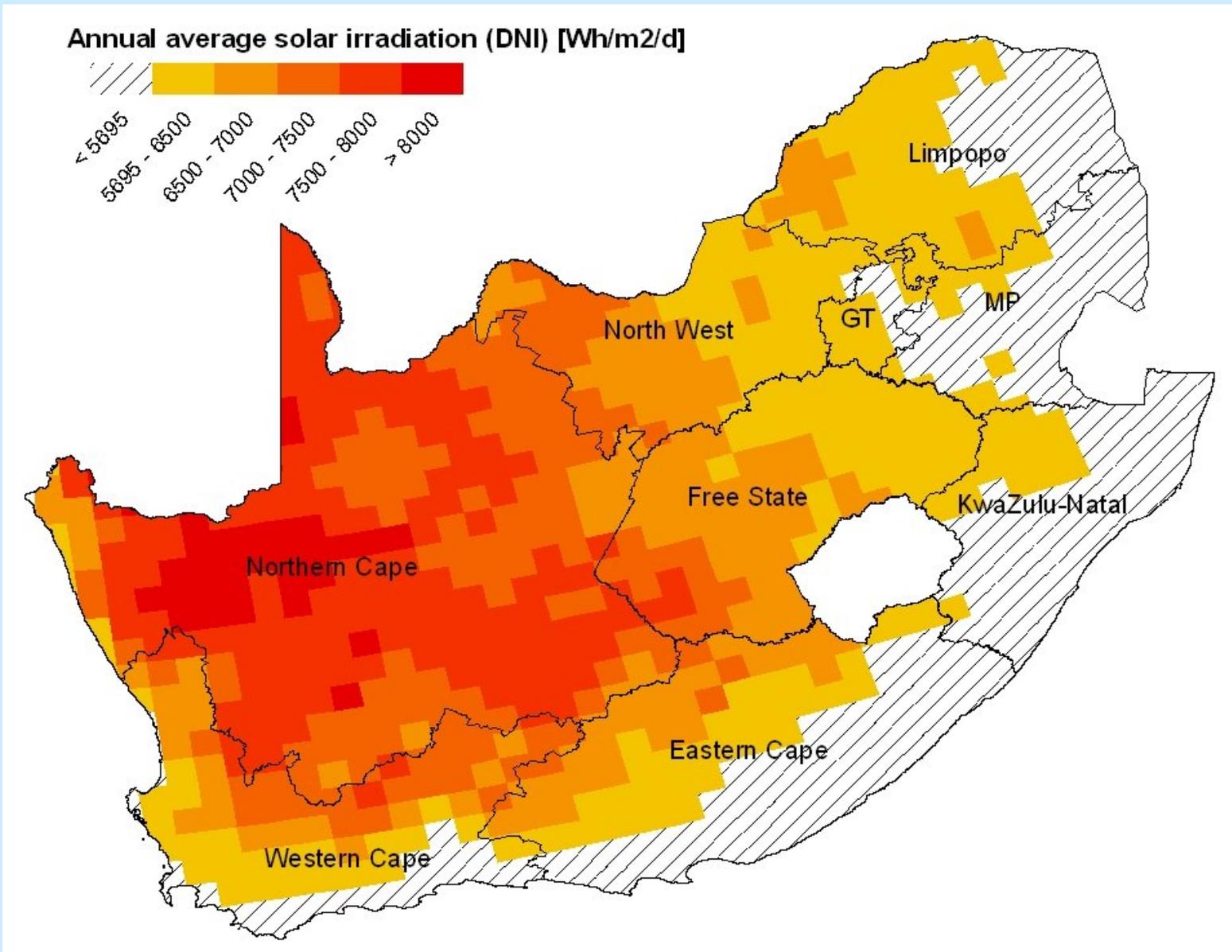
- > Built by Abengoa in Andalucia/Spain
- > Power 11 MWe,
- > 30 min. steam storage
- > Solar field: 75'000 m²
- > **Investment: ≈ 43 M€**

= 0.6B ZAR/11 MW
= 5.1B ZAR/100 MW



© Abengoa

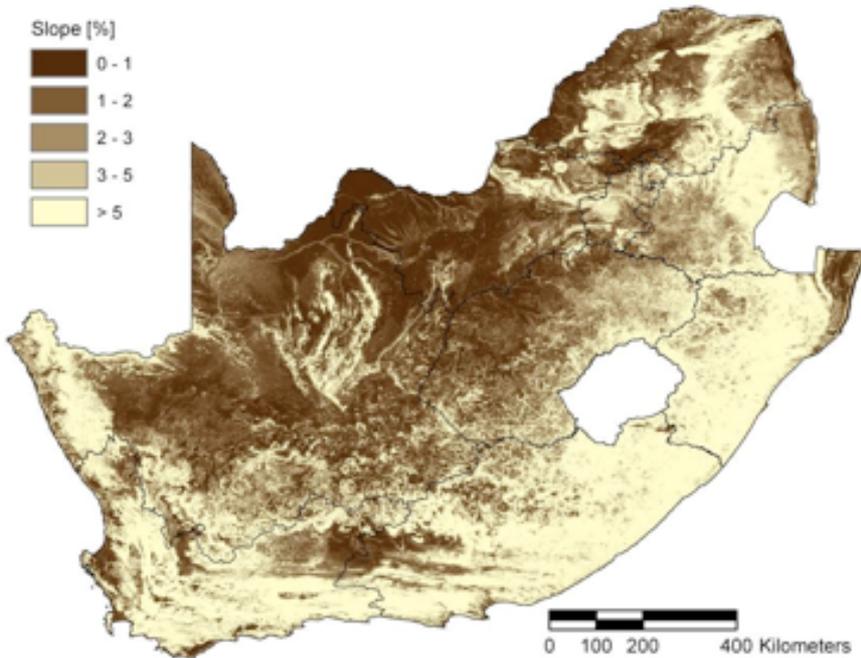
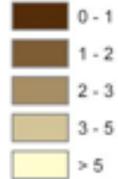
Drivers for CSP rollout



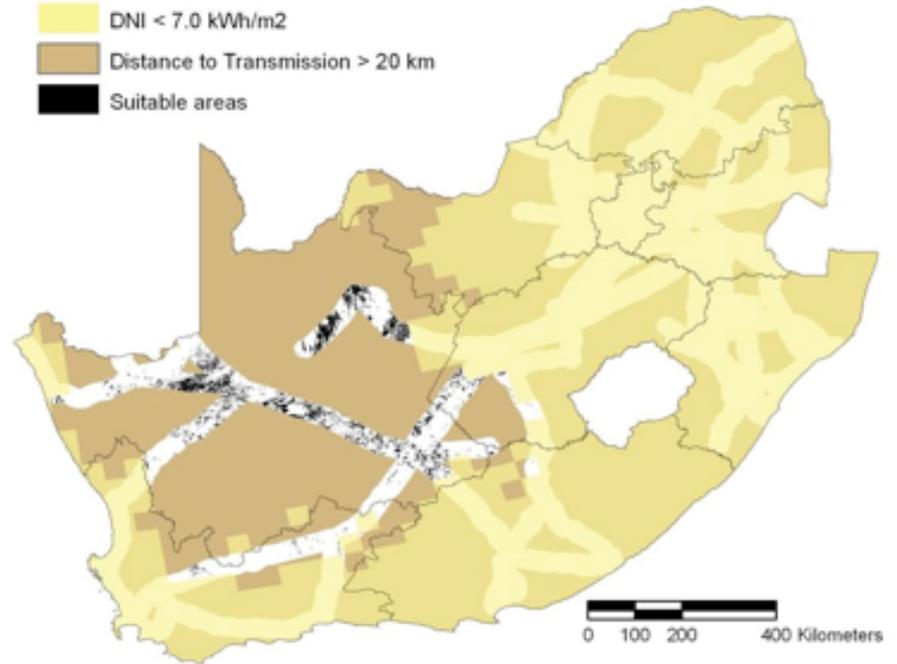
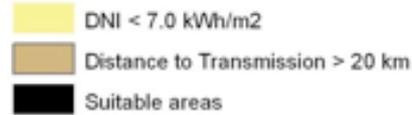
Drivers for CSP rollout

Slope (< 1 %)

Slope [%]

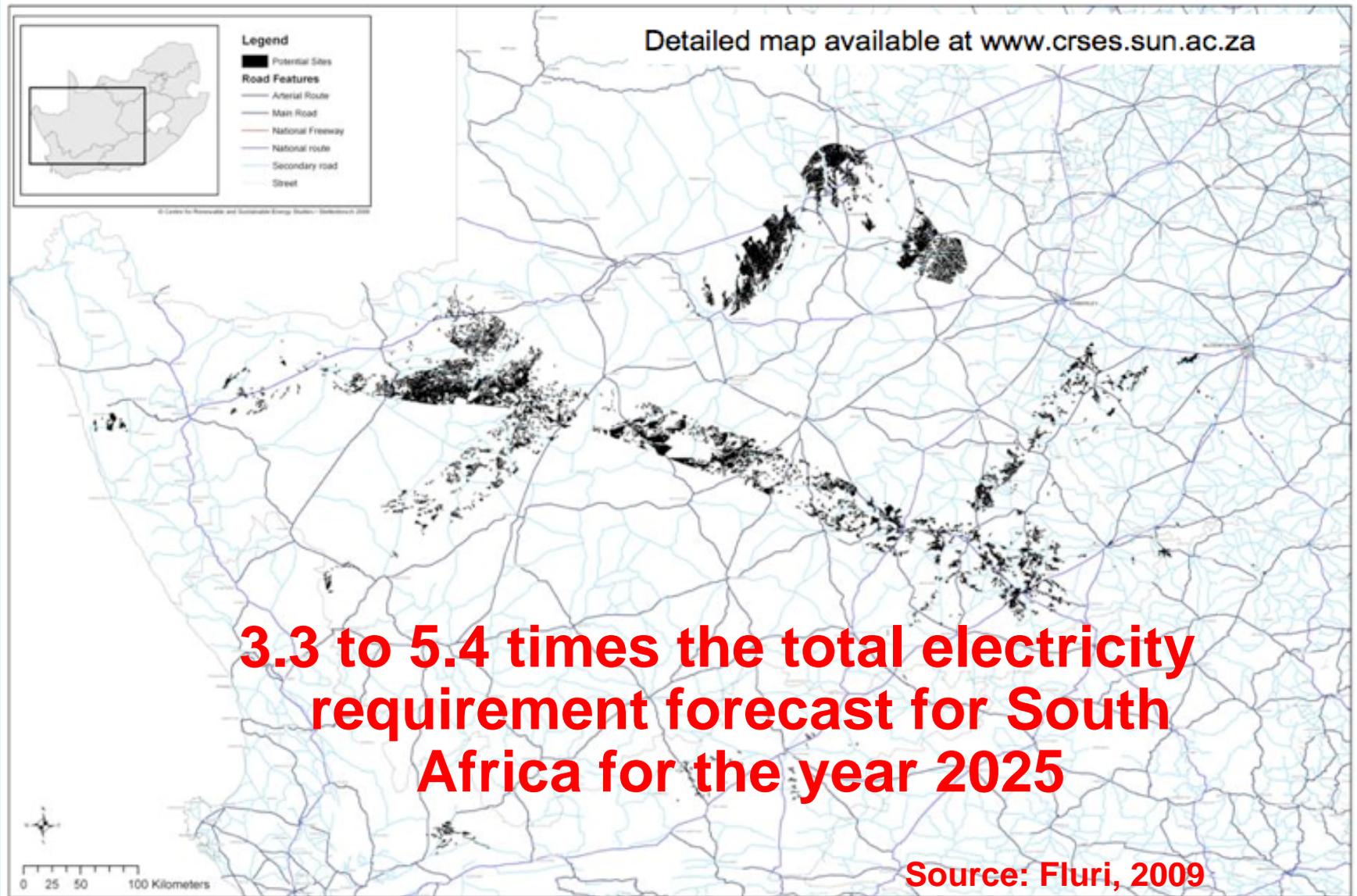


Proximity to Transmission (> 220 kV)



Data Sources: ESKOM, 2008; SWERA, 2008

Drivers for CSP rollout



Financial Driver

Since March 26th 2009

Renewable Energy Feed In Tariff (REFIT) in South Africa

For CSP = ZAR 2.10/kWh

(0.19 Euro/kWh)

Overall positively received:

70% of stakeholders surveyed thought it was “very” and “overwhelmingly” sufficient.

Barrier highlights

- Technology
 - “Seeing is believing”
 - Initial need to import technology
 - Storage requirement in REFIT
 - Backup fuel
- Infrastructure
 - Major grid expansion - Transmission Planning Study required - funding question
 - Water (300 000m³/year) - dry cooling will have to be used

More barriers

- Industry Development for CSP component – great potential from auto industry
 - Investment risk
 - Wrong branding by Eskom: ‘test plant’ should become a “solar industry development program”
- Legal and Regulatory
 - REFIT vs DME bidding process – potential conflict
 - EIA maybe – especially water use
 - Eskom monopoly and lack of transparency

International Support

- Financial support most valuable (76% of survey respondents):
 - Venture capital for CSP start ups
 - Feasibility study
 - Research support
 - Grid: Transmission Planning Study
 - South Africa specific R&D
- Also technical support:
 - South African demonstration plants
 - Storage technology
 - Industry supply base
- And policy & institutional capacity building support:
 - Refine REFIT
 - Managerial support to REPA
 - DME regulation dispute

Thank you!





Energy research Centre of the Netherlands

Connecting domestic policy with international support mechanisms

Heleen de Coninck
Bonn, June 6th, 2009



What international support for domestic policy?

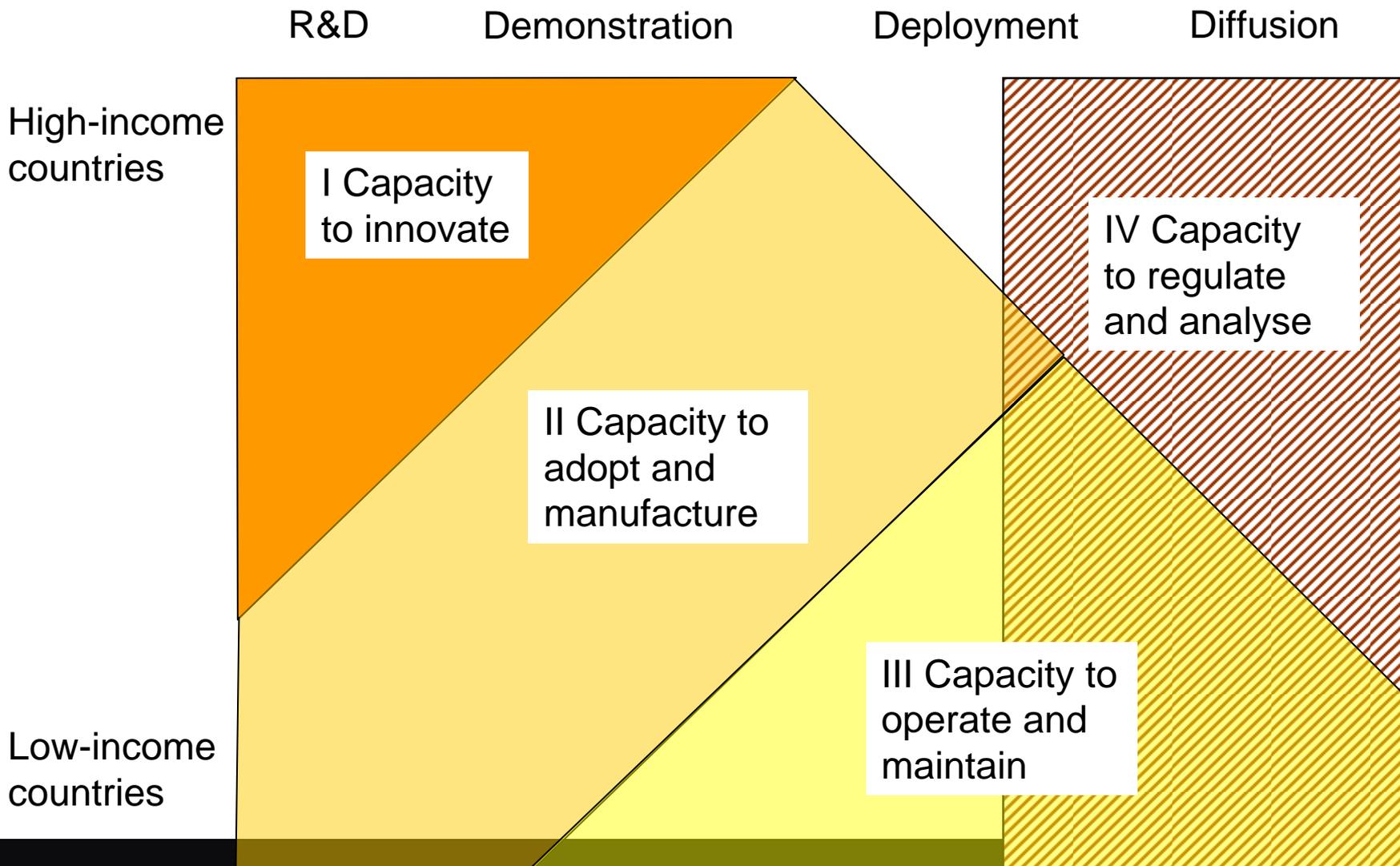
South Africa CSP wedge:

- RE policy and institutional capacity building
- Technical support
- Joint R&D
- Financial support for feasibility, grid expansion
- Venture capital

Ghana RE and EE:

- Awareness raising
- RE and EE policy and institutional capacity building
- Capacity building: financial institutions and rural banks, private sector and ESCOs, specific technical training
- Assistance on technical standard development

On capacity building...



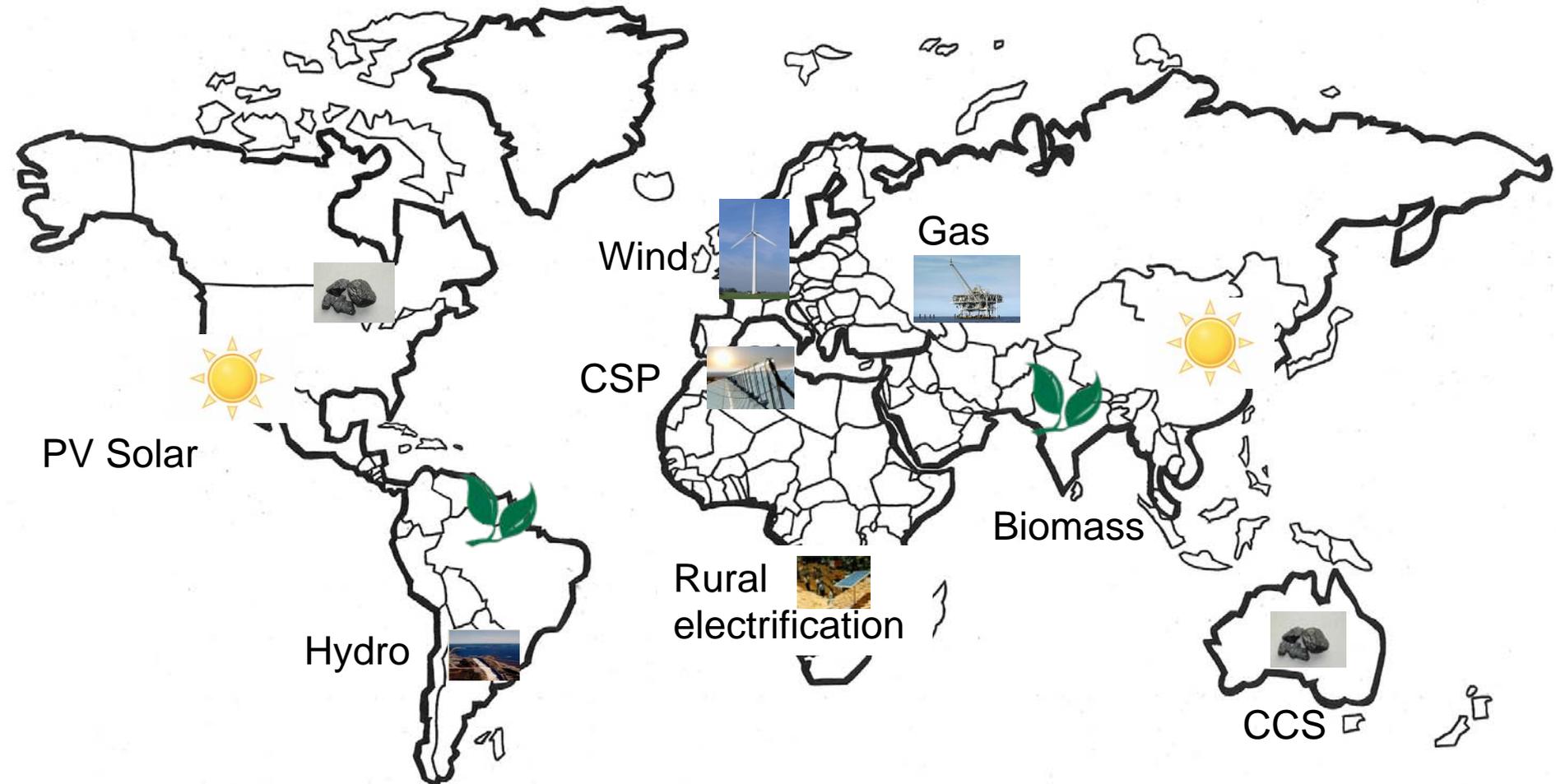
What might Copenhagen offer?

Capacity to innovate, adopt and manufacture:
technology-oriented agreements for RD&D

- Joint R&D on specific technologies in specific agreements between interested countries (e.g. between interested countries in CSP) (South Africa)
- Global Network of Technological Innovation Centres for R&D: focused on specific technology (South Africa)

Sources: Party submissions (e.g., India, Republic of Korea, G77/China, European Union), E3G (2008), ECN (2008), EGTT (2009), WRI (2008)

Network of Technological Innovation Centres for R&D



Applied R&D model: applied R&D, capacity building, energy studies (CGIAR model), focussed on regionally relevant technology

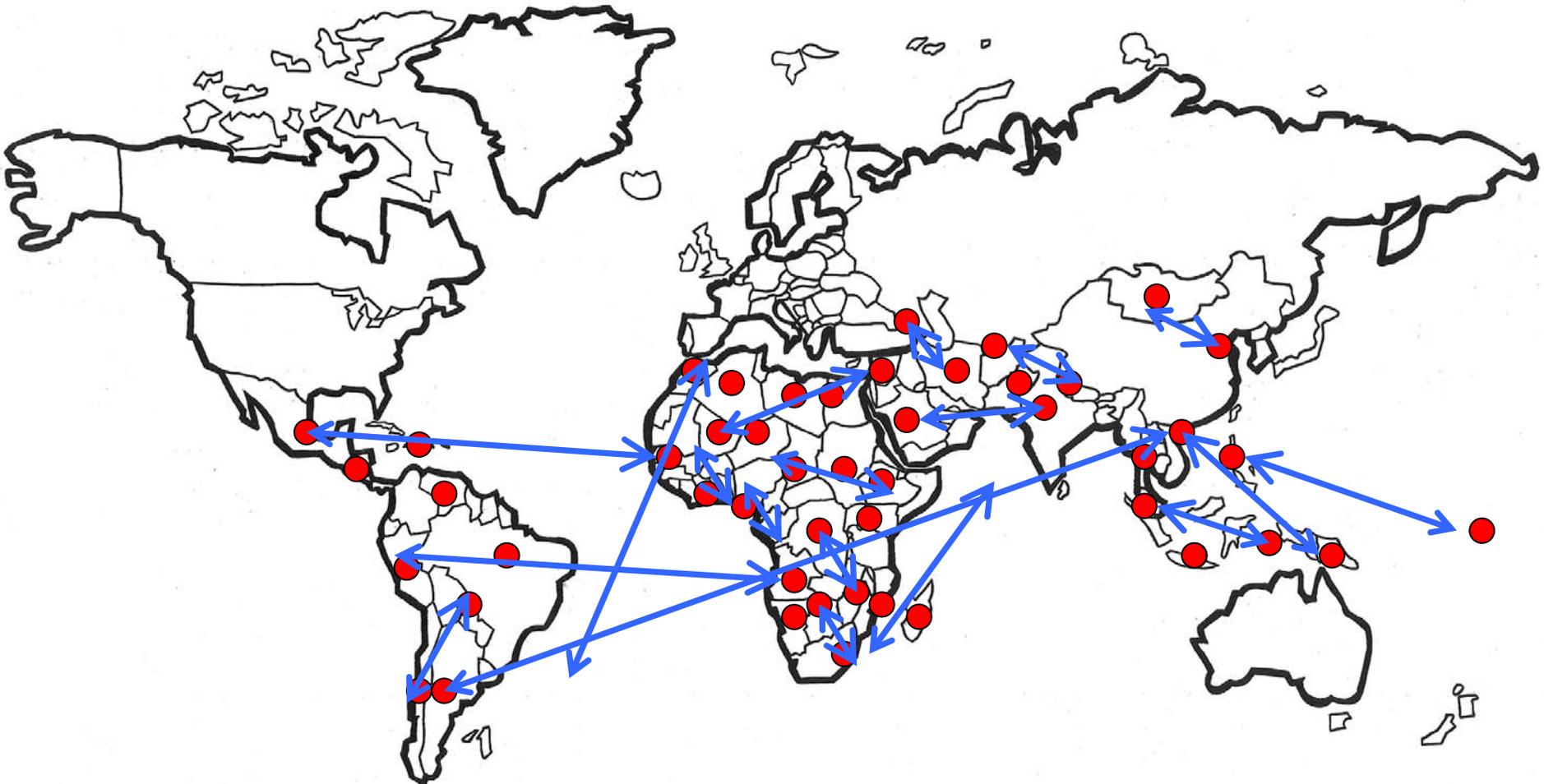
What might Copenhagen offer?

Capacity to regulate, operate and maintain: Network of national or regional innovation centres

- Awareness raising in the local context (Ghana)
- Assistance on technology standards (Ghana)
- Sharing, developing human capacity (Ghana)
- Regulatory cooperation and policy learning (South Africa and Ghana)

Sources: Party submissions (e.g., India, Republic of Korea, G77/China, European Union), E3G (2008), ECN (2008), EGTT (2009), WRI (2008)

Network of national or regional innovation centres



Model that looks after complete 'innovation chain': applied R&D, accelerators, enterprise creation, deployment, modify technology to (Carbon Trust Model)

Bonn
6th June 2009

Energy Efficiency in the Indian Power Sector – Drivers, Actors & Barriers

Anoop Singh

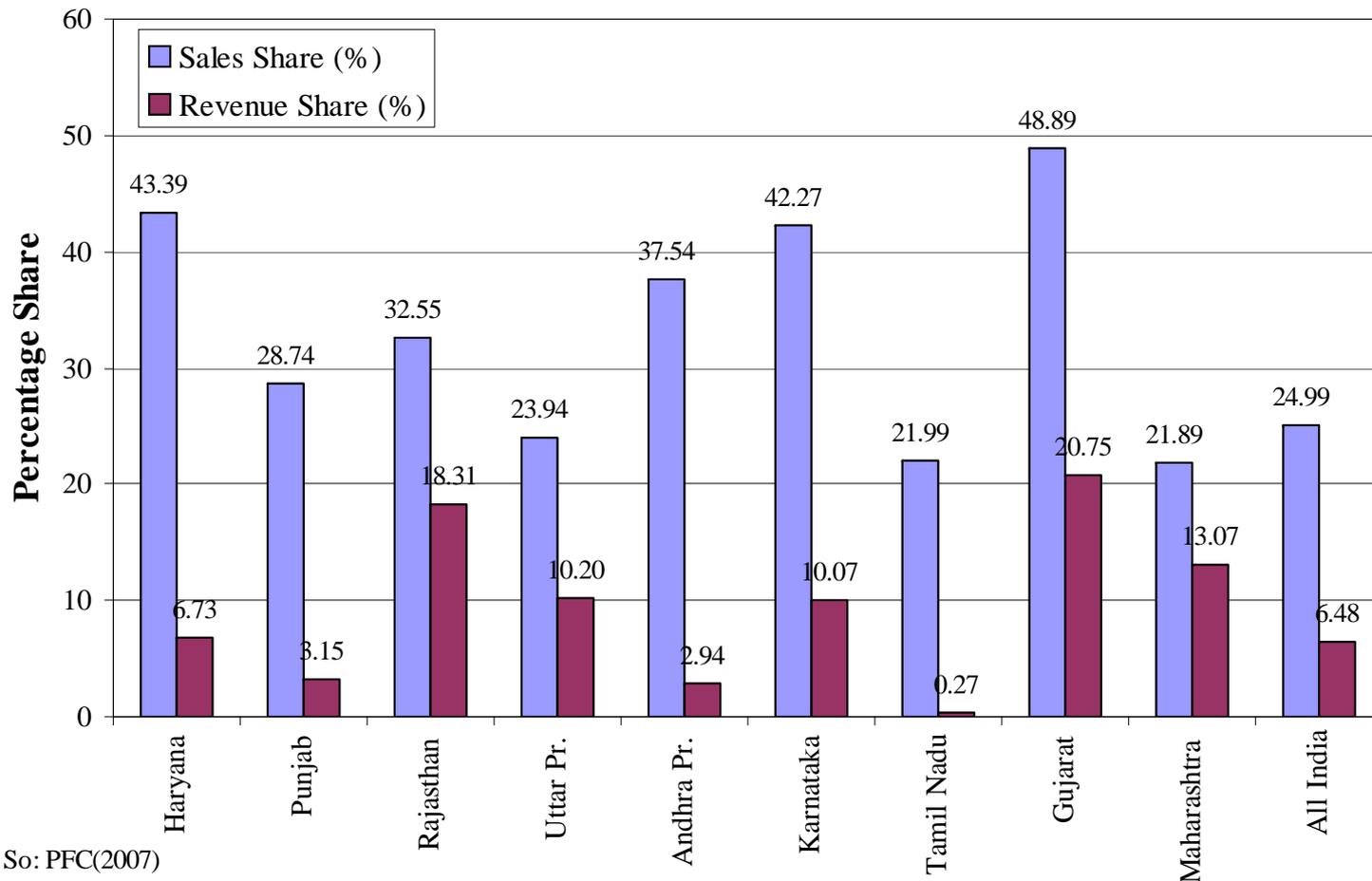
*Dept. of Industrial and Management Engg.
Indian Institute of Technology Kanpur*

Policy options for the Indian power sector

- Clean and efficient coal-based generation technology
- Up-grading distribution network
- (HVDS) + DT metering + IT
- Adoption of Efficient Agriculture Pump sets + Metering + (long term economic benefits)
- Generation
- Network
- Utilization

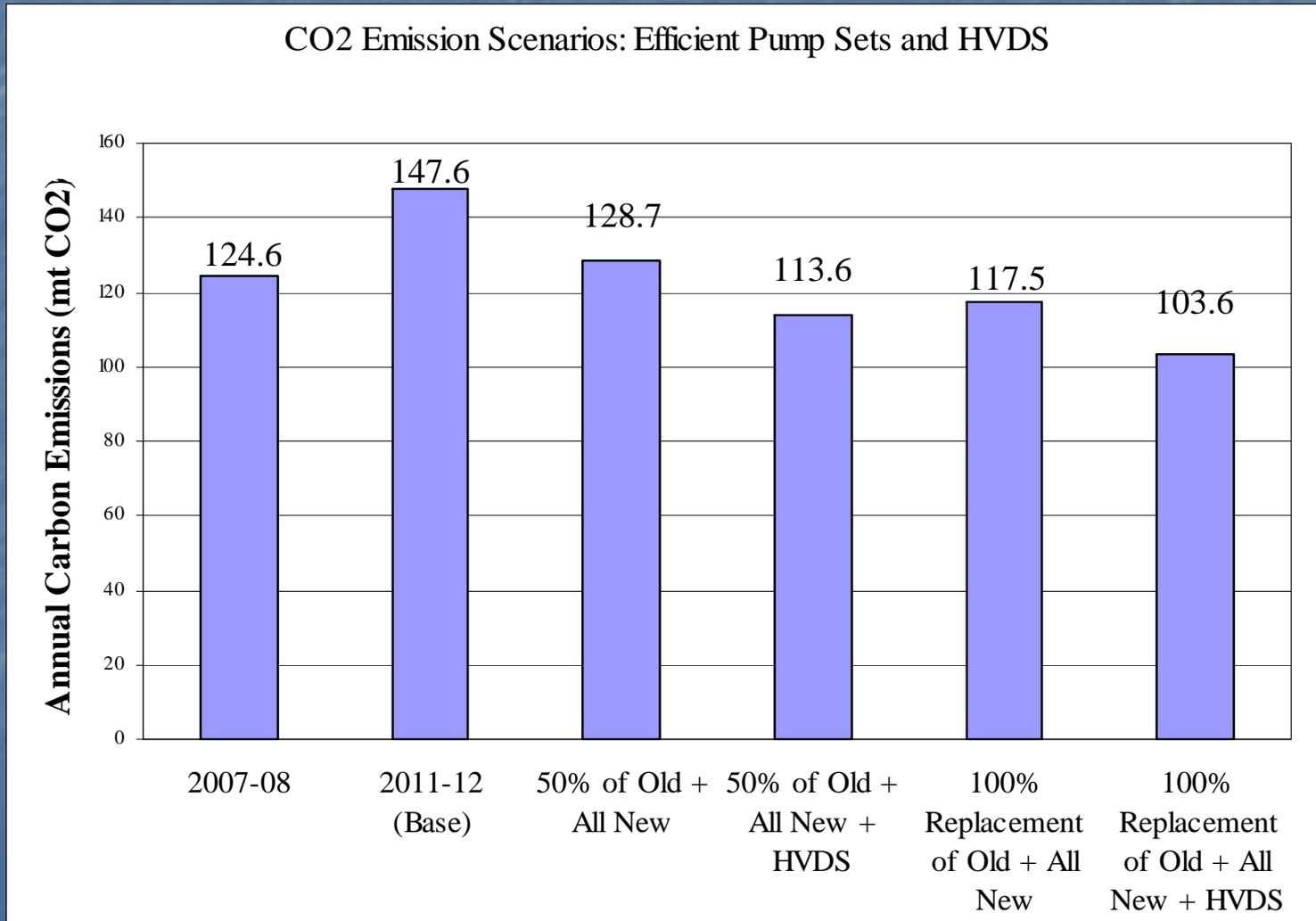
Significance of Agriculture Consumers in Power Sector

Share of Agriculture in Energy Sale and Revenue (2005-06)



So: PFC(2007)

CO2 Emissions Scenarios with adoption of Efficient Pump sets and HVDS



Stakeholders' Responsibility for Policy Implementation

Responsibility	Min. of Power	Min. of Finance	CEA	State Govts.	R-APDRP	CERC	SERCs	Gencos	Discoms	Equipment Mfg.	BEE / BIS	Rural Elec. Corpn.	Others #	Lenders	Intl. Cooperation	CDM financing
	Adoption of Efficient and Clean Coal Technologies															
Policy Formulation	v			v												
Policy Description	v		v	v		v	v	v		v						
Programme Design	v		v	v				v		v						
Implementation								v		v				v		
Monitoring	v		v											v		
Financing		v						v							v	v
	Adoption of Efficient Agricultural Pump sets															
Policy Formulation	v			v												
Policy Description			v				v		v		v	v				
Programme Design				v			v		v		v	v	v		v	
Implementation									v	v	v	v	v			
Monitoring	v			v	v		v		v		v	v		v		
Financing		v			v				v			v		v	v	v
	Modernization of LT Distribution Network to HVDS															
Policy Formulation	v			v												
Policy Description	v		v				v		v	v						
Programme Design	v		v		v		v		v						v	
Implementation					v				v							
Monitoring	v		v		v		v		v					v		
Financing		v			v				v			v		v	v	v

Note: # - including NGOs, consumers, energy service companies (ESCOs) etc.

Drivers, Actors and Barriers

Specific Policy Drivers – Agri. Pumpset Replacement

- Overall energy saving
- Enhanced transparency and accounting of consumption
- Reduced pressure on groundwater reservoirs
- Ability to manage tariff subsidy
- Facilitate appropriate tariff design

Key Actors – Agri. Pumpset Replacement

- ESCO/Implementing Agency
- Distribution company
- State governments
- Regulatory institutions
- Central government

Barriers – Agri. Pumpset Replacement

- Institutional/political
- Financing
- Project Implementation & Operation
- Monitoring
- Technical

Barriers

	Technical	Impl./ Admn.	Financial / Economic	Political
Efficient and Clean Coal Technologies	Y	N	Y	N
Efficient Agri. Pumps	N	Y	Y	Y
Dist. Network Up Grading	N	n	Y	y

Existing International Cooperation

- GTZ – Energy Efficiency / BEE
- USAID – Agri. Pump set Replacement
- KfW – Financing for HVDS

Indicators

- Efficient Generation Technology
- Share of Generation (MWh) by efficient generation technology.
- Energy Saved
- Policy for SC for plants above 500/600 MW

- Pumpset Replacement
- MW of pumps replaced
- MWh of energy saved
- Number of Pumps/DTs metered

- Upgrading Distribution (HVDS)
- km of LT lines replaced with HVDS
- Reduction in Grid Losses (%)
- MWh saved

Thank you

International Support for Domestic Action



Brazil case study:

Transportation System

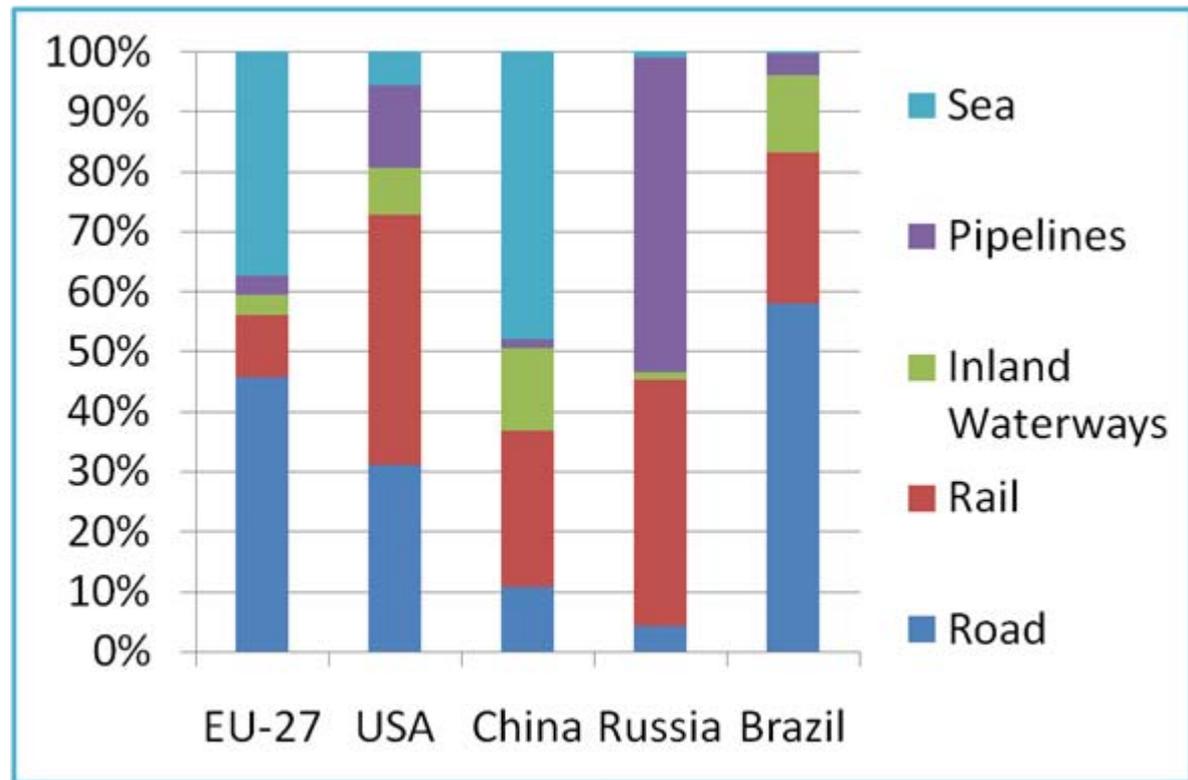
Márcia Valle Real

*Policies implementation for low carbon freight and
international support options*

Brazil's biggest problem: Intensive use of Road Transport

- Energo-intensive mode;
- High costs for commodities transport;
- Infrastructure in bad conditions;
- Low safety traffic;

Freight Transport (tkm)



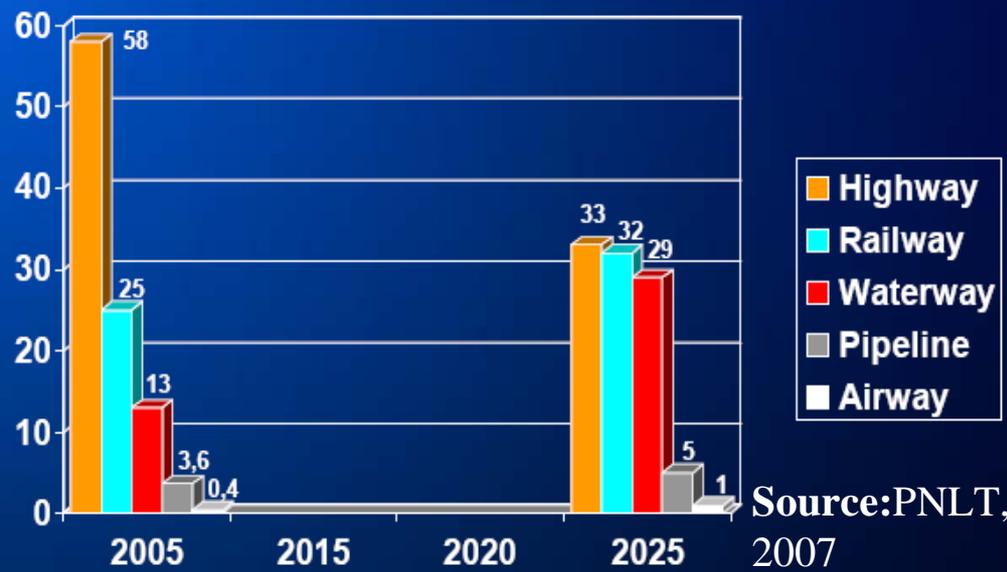
Federal Government Plan



“The National Plan on Logistics and Transport: a policy that can promote a significant change in the modal split in the country”

The reduction of freight by road has potential to mitigate GHG: 10 to 20% of freight emissions

Workshop conducted to assess how to achieve the target.



Drivers

- Low-cost for freight
- New jobs in rural communities along the new infrastructure
- Improve the competitiveness of local agricultural producers on the international market

Barriers

- Lack of political coordination in government
- Lack of technical capacity in the road sector (over 50% of truck fleet driven by truck owners)
- Long payback period on investment
- Requires use of new freight service

**Proposal of best indicators for evaluating the policy success
of changing modal split in Brazilian freight:**

Financial resources government applied/ intermodal station

Number of intermodal stations installed

Cargo handled / intermodal station

Quantity of fuel sold in areas of intermodal stations



The role of indicators for effective policy implementation

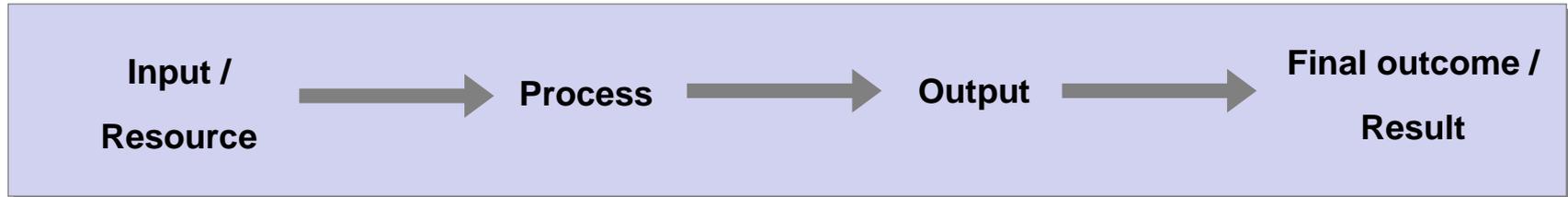
E&E Seminar, Cambridge, June 1st, 2009

Karsten Neuhoff, Tim Laing, Sarah Lester, Adam Rysanek

Experience with metrics: literature base

Case Study	Sectors and Level of metrics	Literature base
Sustainable Development and environmental metrics	National/ all sectors/ OECD	<ul style="list-style-type: none"> • Sustainable development policy • Environmental evaluation and monitoring. Infrastructure and land-use planning
Indicators for Overseas Development Aid	International development plans /National indicators/ all sectors.	<ul style="list-style-type: none"> • International development literature • Development institution measurement (World Bank, IMF and IEA literature). • Globalisation, trade and aid literature
UK government Performance Indicators (PSA framework)	From local level and national targeted priorities for UK public sector governance.	<ul style="list-style-type: none"> • Results-Based Management (RBM), Performance Management Frameworks • Public administration, performance budgeting and indicator systems
Key Performance Metrics (KPI)	Firm level indicators.	<ul style="list-style-type: none"> • Business Process Management (BPM). • Corporate Social Responsibility (CSR) • Operational/strategic performance management. Systems thinking
OECD Science and Technology Indicators	OCED aggregated indexes of innovation for technology development.	<ul style="list-style-type: none"> • Technology policy and Innovation chain literature. Renewable and energy literature. Low-carbon electricity systems

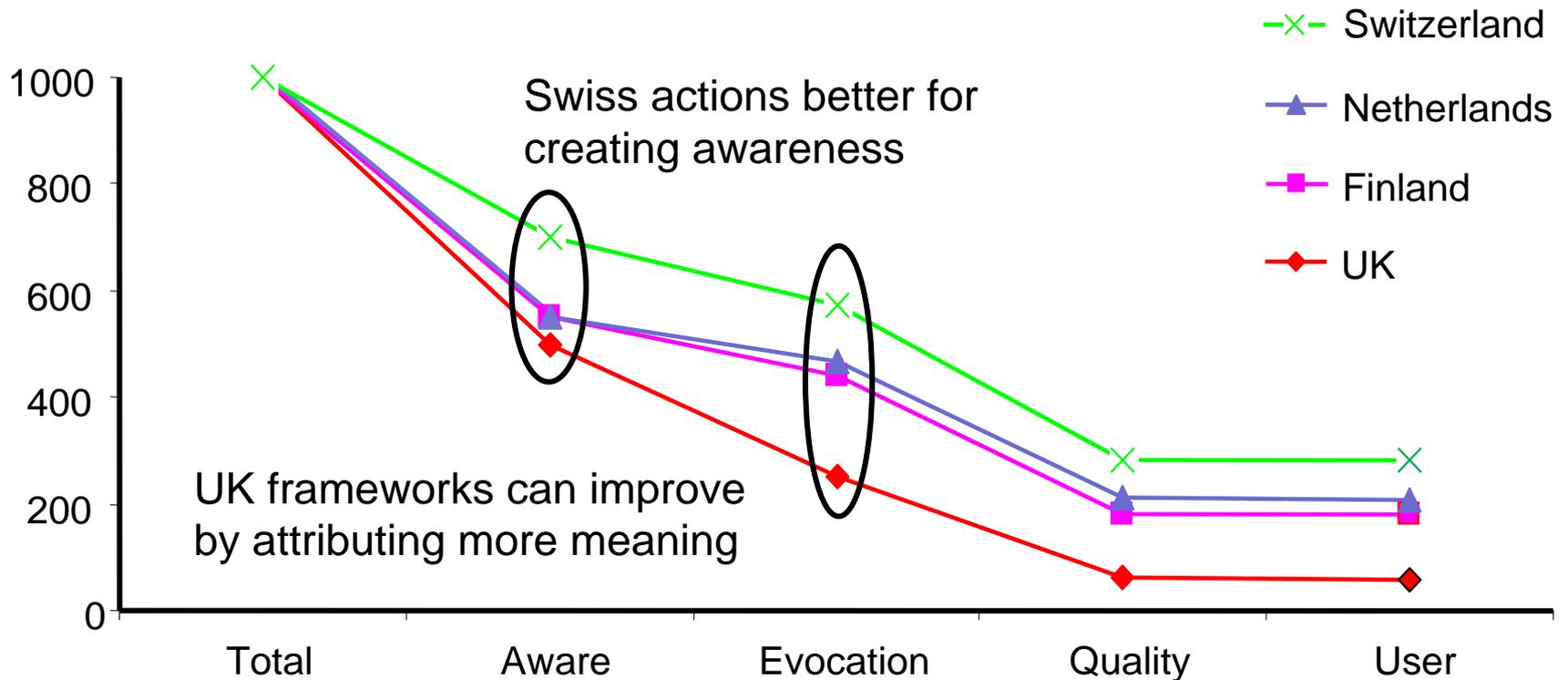
Framework: Indicators to Manage Implementation, Facilitate Learning, and Monitor Success



- **Input indicators** can quantify the resources that are available to address a problem
- **Process indicators** can measure the short-term reaction of stakeholders to these actions
- **Output indicators** can illustrate the results of the input activities
- **Outcome indicators** can monitor if the framework is meeting its long-term goals

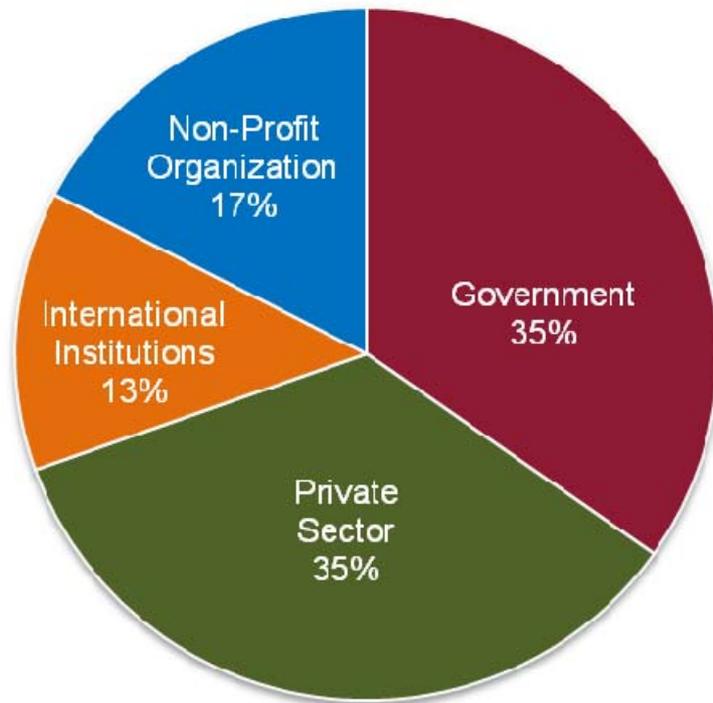
How indicators facilitate international learning?

Based on interpretation of various surveys

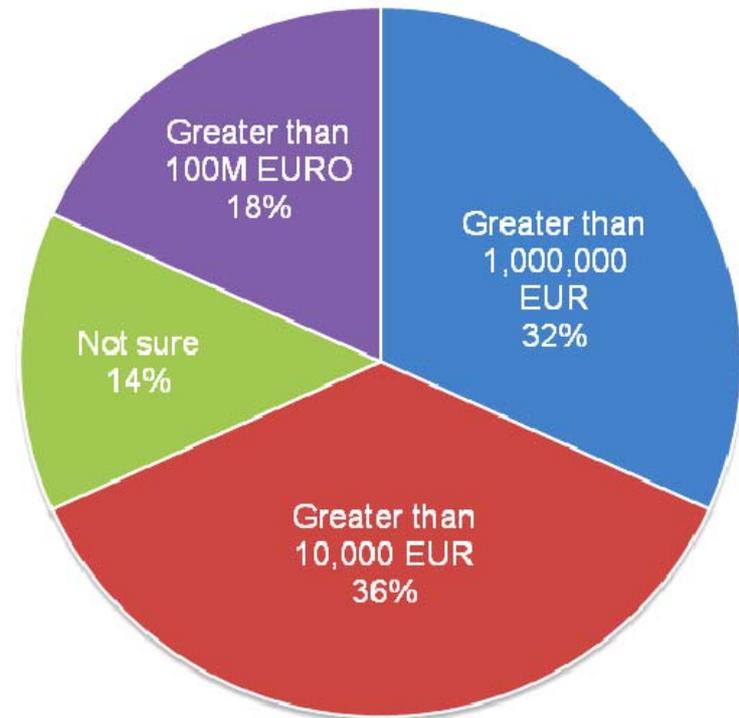


Survey to compare use of indicators across sectors (preliminary results!)

Sector of Participants' Activities

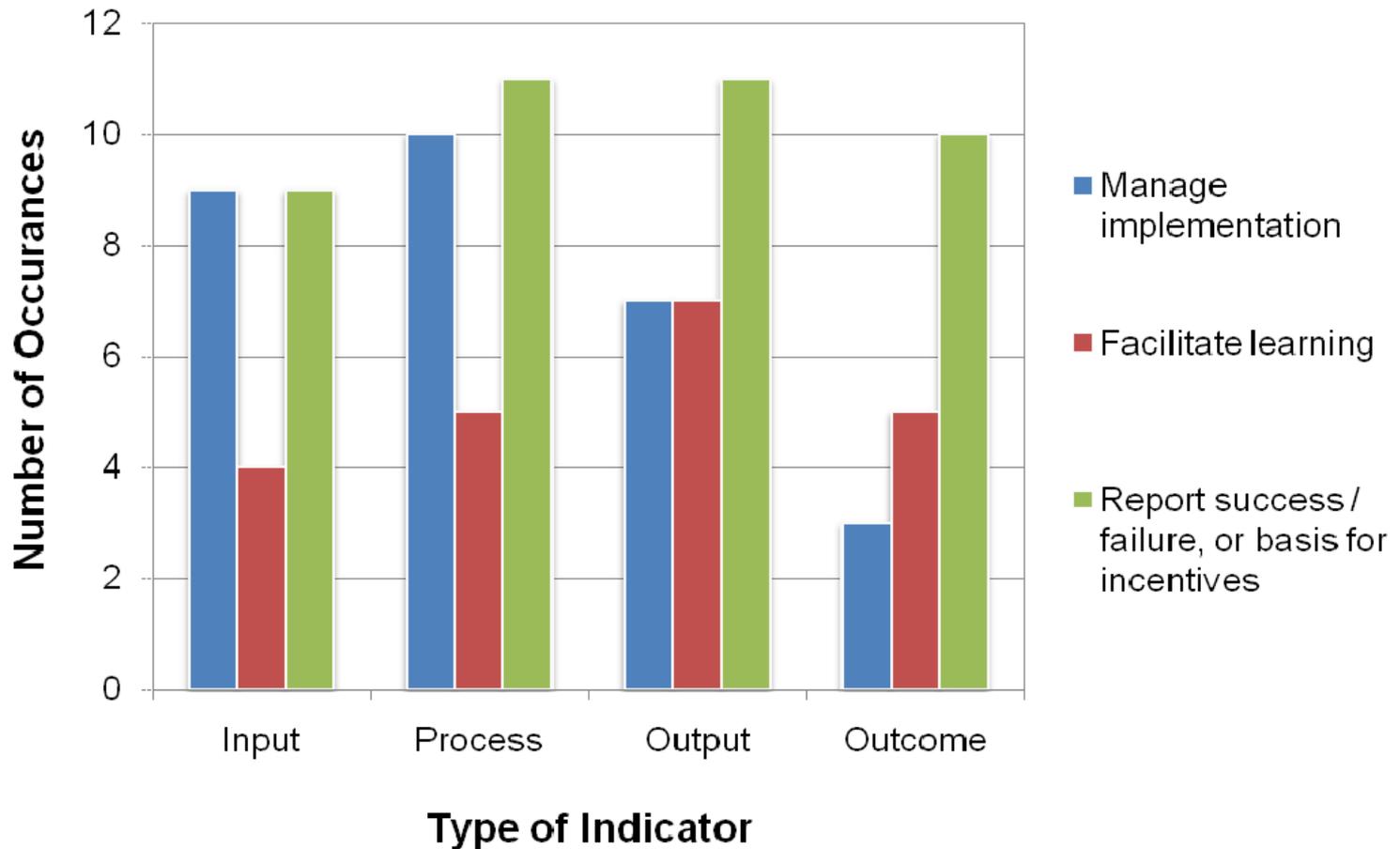


Size of Projects / Policies



Preliminary Survey Results

Distribution of Indicator Objectives / Roles



UNFCCC Indicators

- Only GHG inventories mandated (even then there are exceptions!)
- Use of other indicators are encouraged, but not mandated.
- Leads to wide variety of indicators used by different countries
- Makes comparability hard

Reported Indicators in NCRs

Country	Industrial Indicators			Agricultural Sector		Transport Sector	Energy Sector				
	Industrial Structure	Cement	Steel	Fertiliser Use	Livestock Indicators	Overall	Overall Energy Use	Electricity Indicators	Fossil Fuel indicators	Pricing/ Subsidies /Taxes	Other
South Korea (Second NCR)	Korea's Industrial Structure			Fertilizer Consumption	Number of Livestock	Progress of Korea's Passenger Transportation	Primary Energy Consumption by Source	Status of ESCO Registrations			Results of Voluntary Agreement
Uzbekistan (Second NCR)					Cattle and poultry livestock, thousand heads	Transport growth rate (passenger turnover)		Structure of the established capacities of power plants in Uzbekistan	Coal production during 1992-2004,	Prices for electric and heat power	Dynamics of internal consumption fuel-and-power resources by sectors,
Brazil (1st NCR)	Index of real product-Industry	Cement production	Raw steel production	Manure management systems	Distribution of Cattle on Brazilian Territory	Evolution of ethanol production	Gross Domestic Supply of Energy by Source	Installed Generating capacity	Production of run-of-mine coal		Consumption of charcoal from reforested areas
China (1st NCR)	Ratio changes in primary and medium products and industrial finished products in China's import and export products		Casting ratio of steel-making in iron and steel industry	Consumption of chemical fertilizers on farmlands in China	Number of major livestock on hand in China	Number of civil aviation routes	Consumption of China's proven energy resources and remaining exploitable energy resources	Installed capacity of power generation	Length of Petroleum and Gas Pipelines		Energy consumption per unit product of some major building materials
India (1st NCR)		Share of industry in GDP			Livestock population, excl poultry	Total number of registered motor vehicles in India	Commercial energy production	Growth of electricity	Share of petroleum imports in total consumption		GDP per unit of energy use

Note: Demographic, Social, Macroeconomic, GHG and climate related indicators are also reported

Note: Highlighted indicators represent statistics also reported at the IEA level.

Designing indicators to meet objectives

- Management of program/policy implementation
- Identification of best practice and international learning
- Create transparency to attract private sector investment & innovation
- Accountability to domestic constituencies
- Mutual accountability in the case of international cooperation

Trade-offs

- 1) Qualitative vs. Quantitative
- 2) Collection Cost vs. Usefulness
- 3) National vs. International Reporting
- 4) Input vs. Outcome

Trade-off: Input versus Outcome

Policy target applied to:

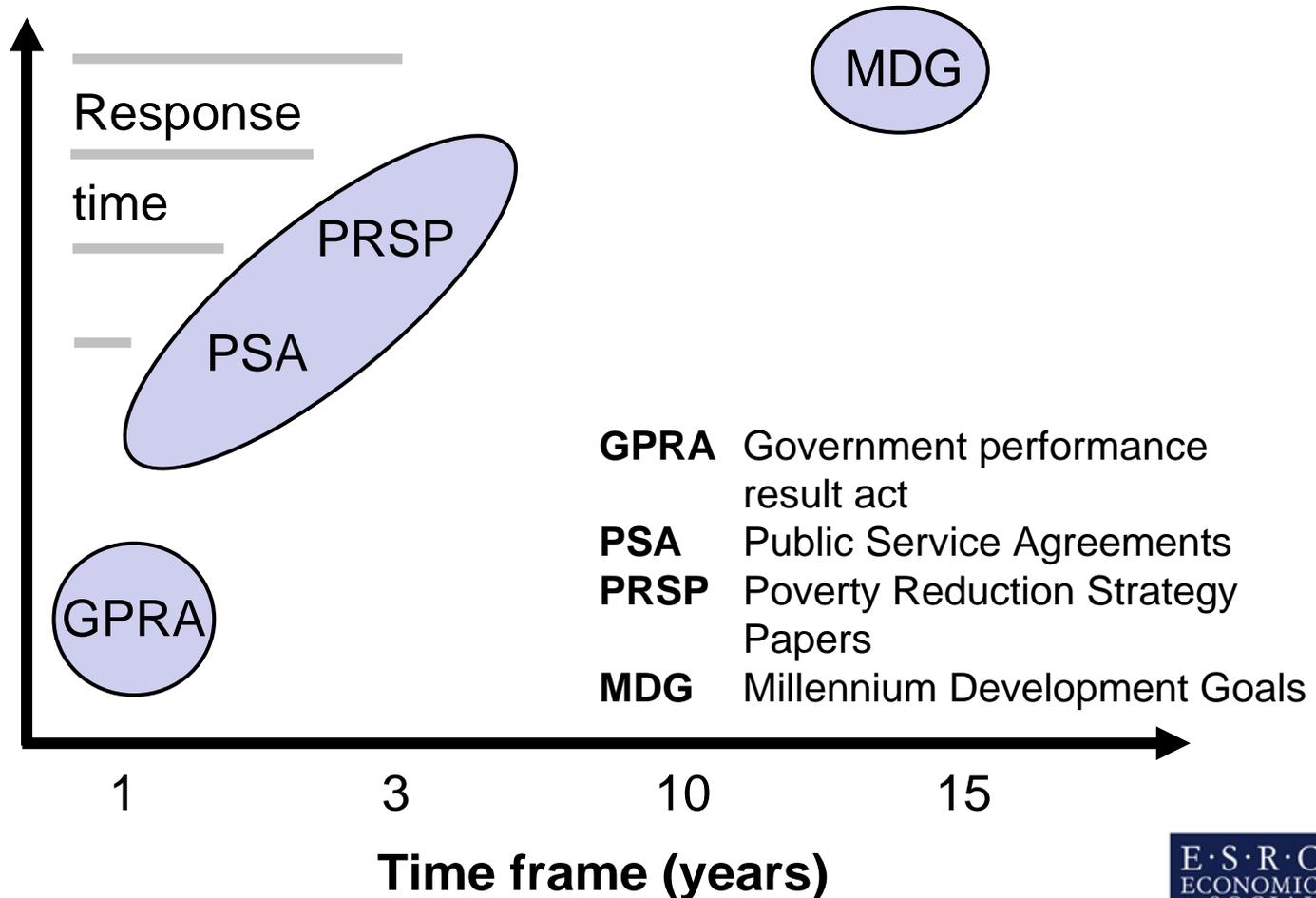
- Allow comparison of policy effectiveness
- Often more difficult to define

Outcome

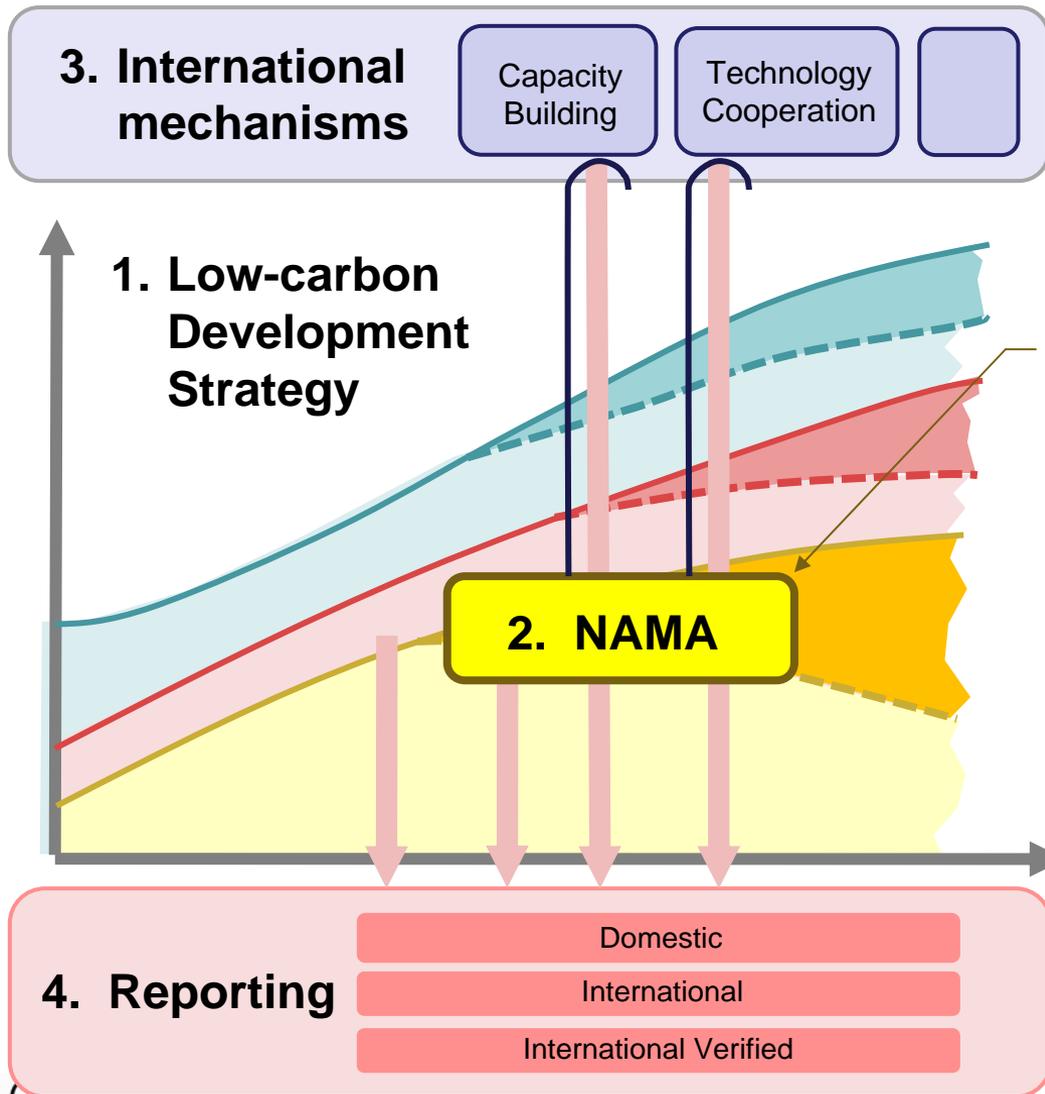
- Response time
- Identify barriers

- Easier to measure
- Can ignore important interactions / focus too narrowly

Input



Conclusion



- How to access?
- Type of support provided?
- Multilateral/bilateral?

- Detailed actions required?
- Domestic drivers & barriers?
- Engagement of private actors?
- Needs for international support?

- Objective of reporting?
- Type of indicators?