

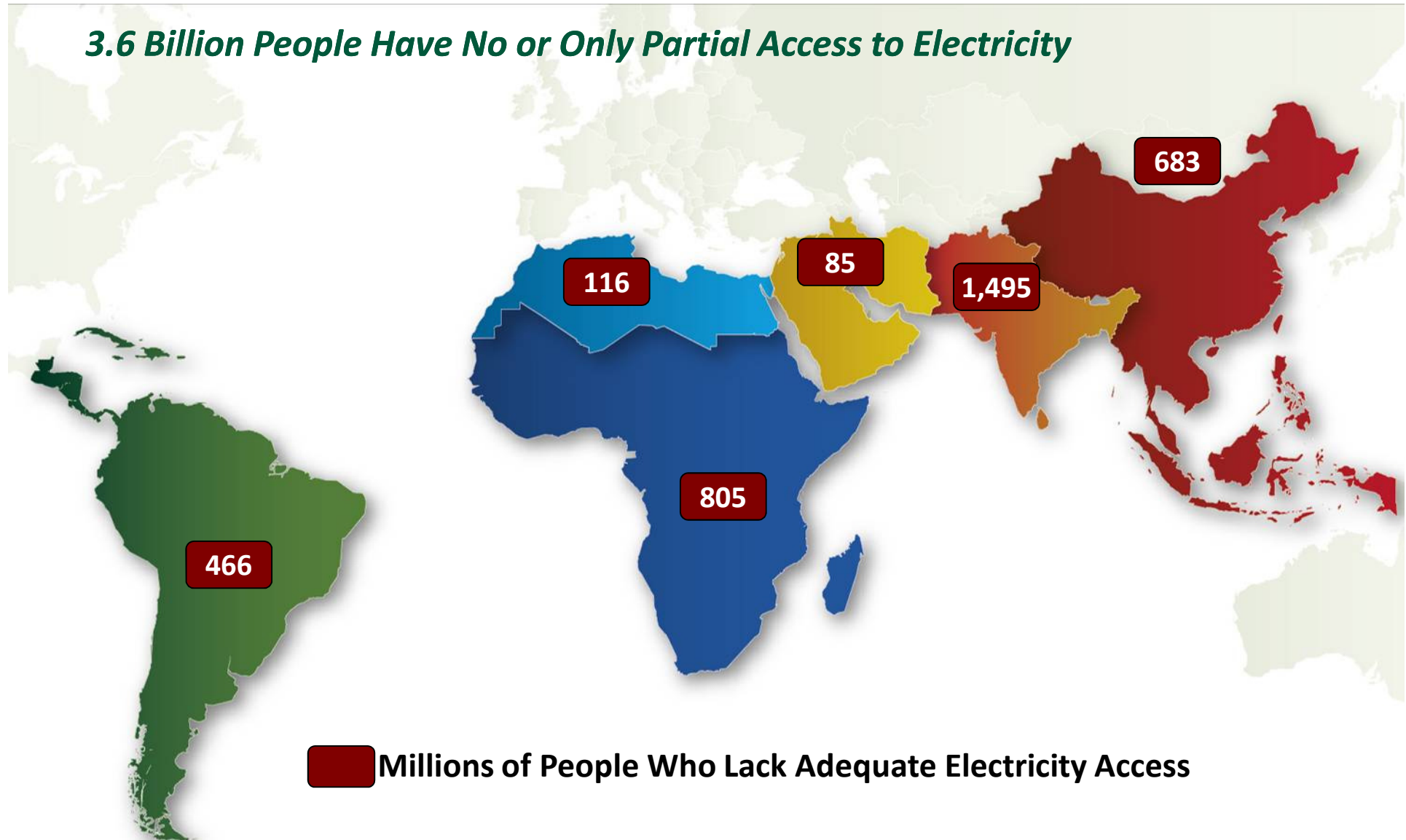
# “Energy Equity and Innovation in Emerging Countries”

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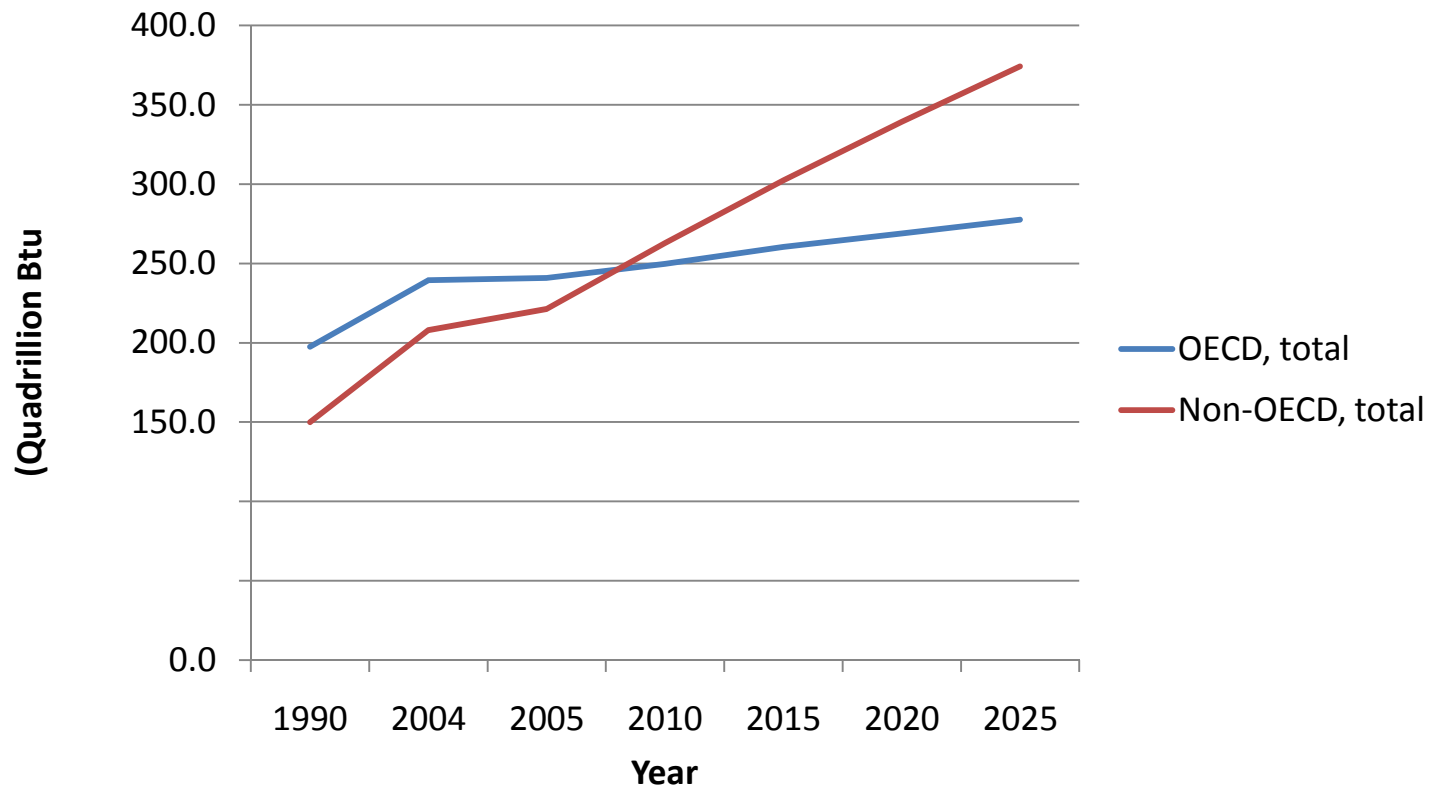
# Access to Low-Cost Electricity Vital to Achieve Millennium Goals



Source: International Energy Agency 2009 World Energy Outlook and The World Bank, 2010.

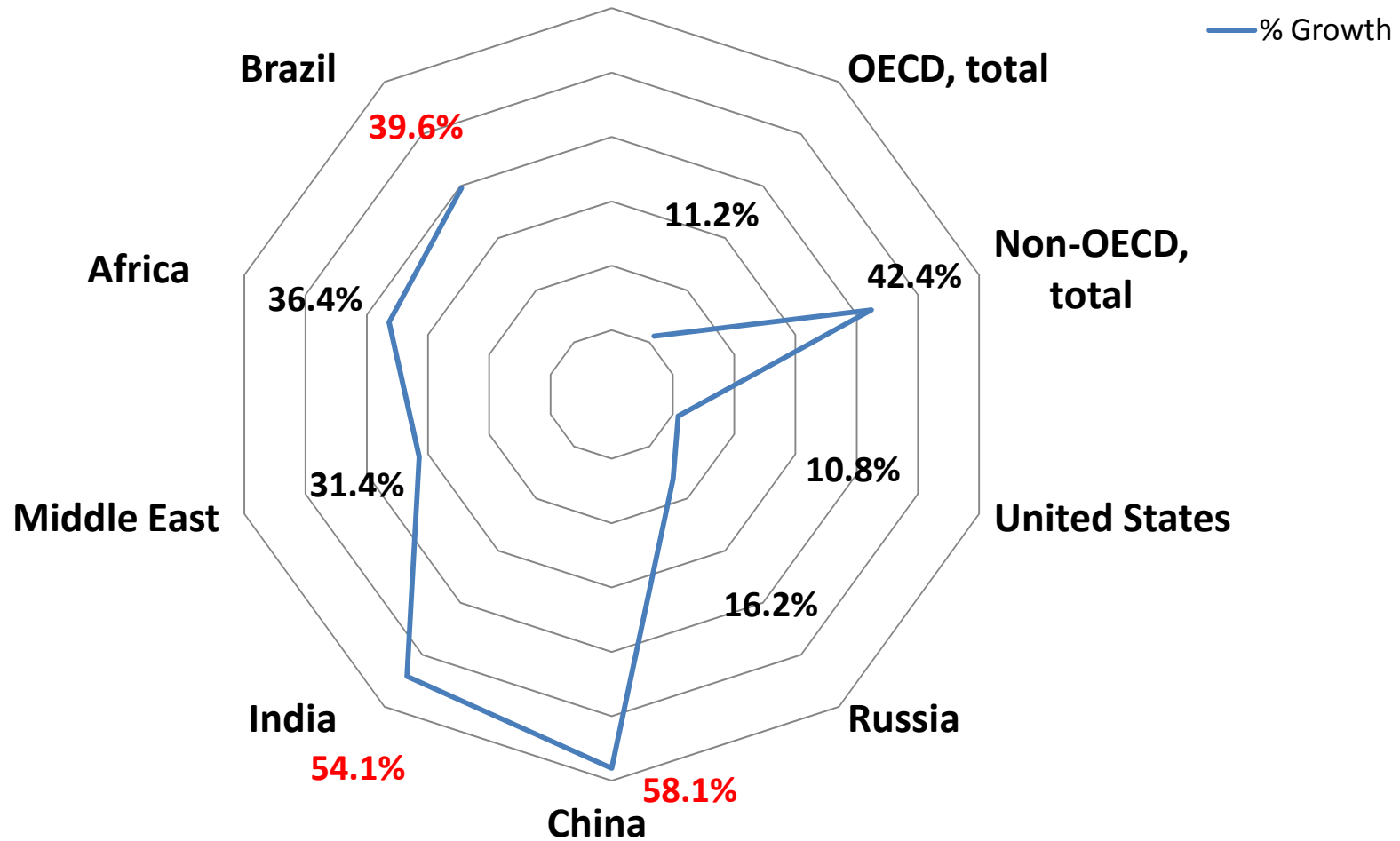
## Emerging countries → rising energy demand

Energy Consumption (Quadrillion Btu)							
Region and energy source	1990	2004	2005	2010*	2015*	2020*	2025*
OECD, total	197,5	239,4	240,9	249,7	260,5	269,0	277,6
Non-OECD, total	149,9	207,9	221,3	262,8	302,5	339,4	374,2



# Emerging countries → rising energy demand (cont.)

## % Energy Demand Growth 2025\*



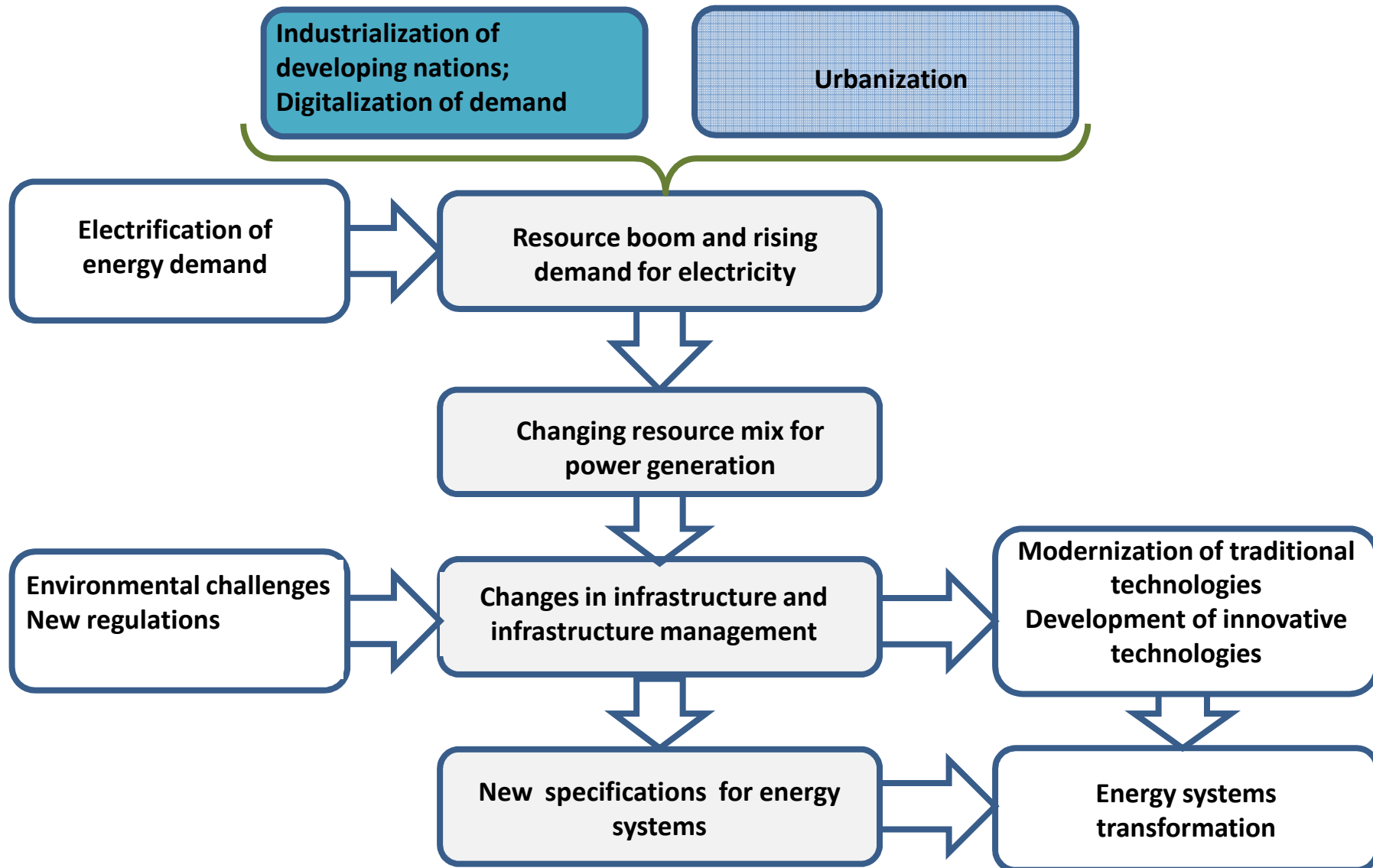
\* Versus 2010 estimations

# Main Energy Challenges

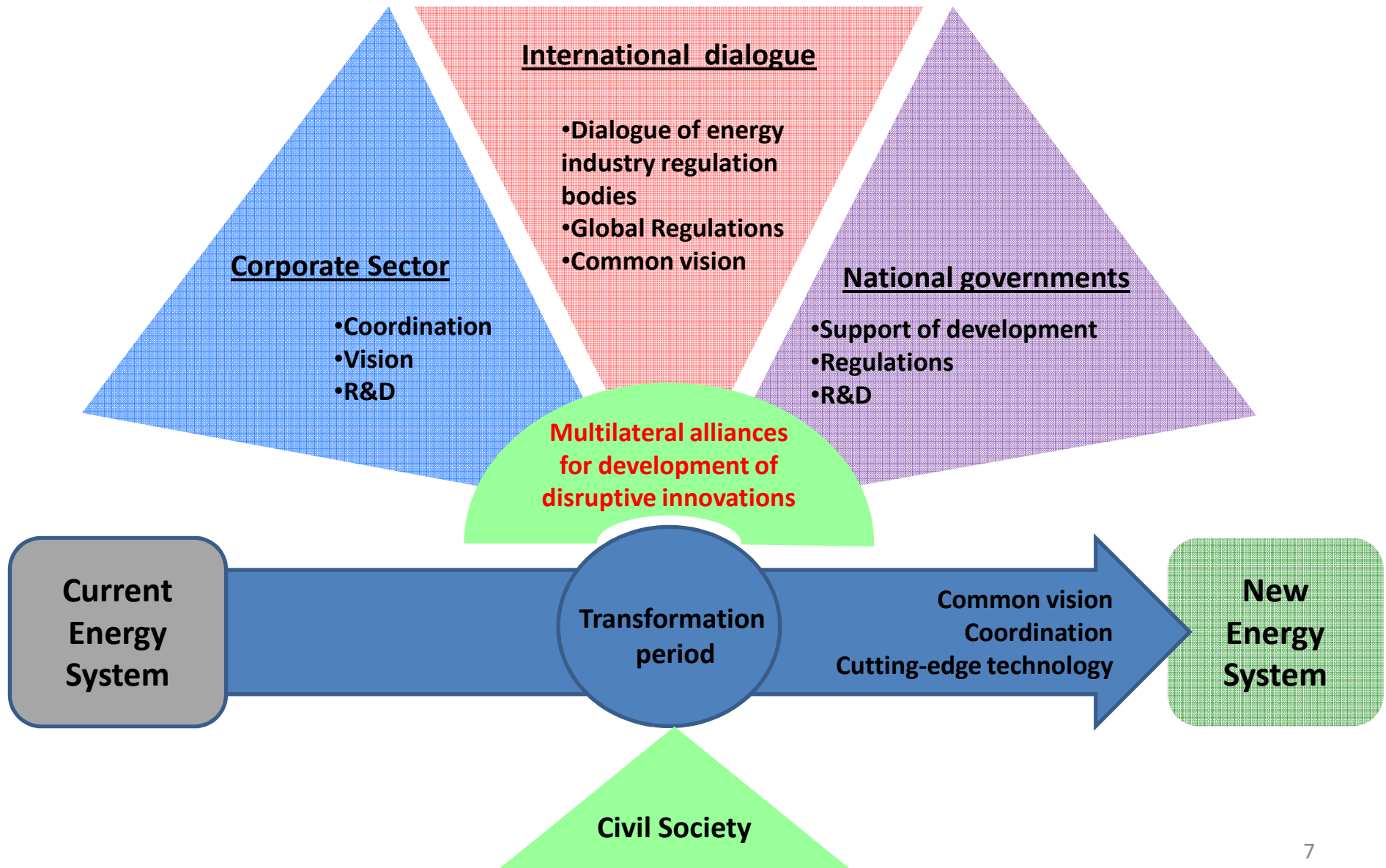
## The 4 As:

- **ACCESSIBILITY:**  
Meeting energy demand, Energy Poverty, Urbanization
- **AVAILABILITY:**  
Technology Deployment, Energy Security
- **ACCEPTABILITY:**  
Energy and climate change, Energy and transport
- **ACCOUNTABILITY:**  
Regulations

## Framework conditions for energy systems transformation



# What is needed to provide optimal transformation of energy systems?



## Five phases of the energy “innovation lifecycle”

**Innovation is actually a set of interrelated processes that can be broken down into five basic phases:**

- Discovery
- Development
- Demonstration
- Commercialization
- Maturation

Each phase is undertaken by a different and evolving network of participants, and each has its own distinct policy needs.



## Innovation networks

**Innovation is also a network activity.** While there are many different types of participants, for the most part, they can be categorized into five basic groups:

- **Researchers:** University, government, and corporate R&D researchers.
- **Producers:** Manufacturers of energy equipment and components.
- **Financiers:** Public and private investors in energy projects and companies.
- **Users:** Utilities, building owners and managers, private power generators, vehicle drivers, or anyone who uses or operates energy technology.
- **Regulators** Those who participate in setting the rules and apportioning public resources for the above mentioned activities.

Embracing the knowledge economy...

## Knowledge Economy



*An economy that creates, disseminates, and uses knowledge to enhance its growth and development*

## Embracing the knowledge economy (cont.)

Four critical pillars of the knowledge economy:

- **Strengthening the economic and institutional regime (rule of law)**
- **Developing educated and skilled workers**
- **Creating an efficient innovation system**
- **Building a dynamic information infrastructure.**

To be competitive in the global knowledge economy of the twenty-first century, emerging countries should continue to focus its efforts on further reforming its overall economic and institutional environment and improve its overall trade and investment climate.

# Knowledge Economy Index

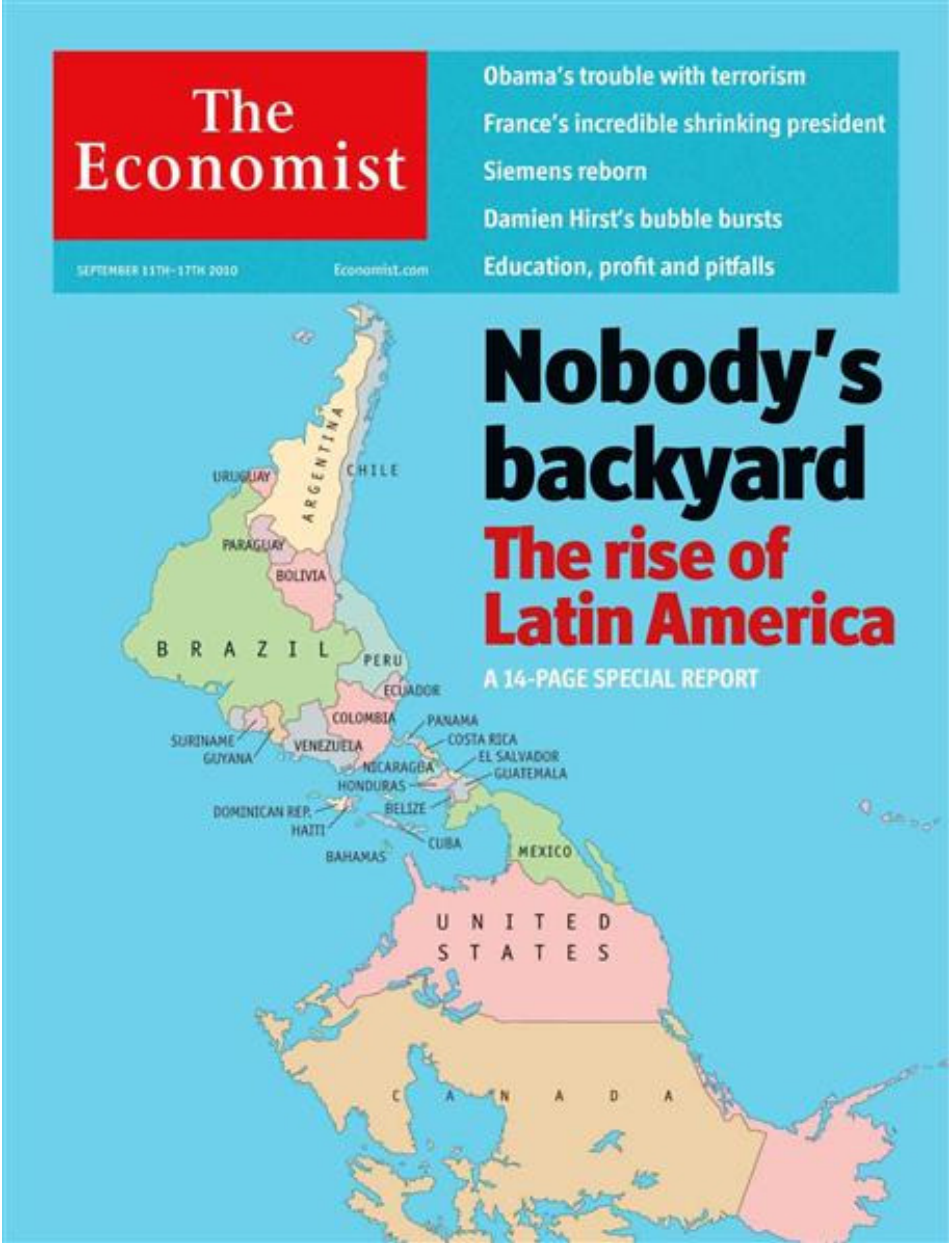
Rank	Country	KEI	Economic Incentive Regime	Innovation	Education	ICT
1	Denmark	9.52	9.61	9.49	9.78	9.21
2	Sweden	9.51	9.33	9.76	9.29	9.66
3	Finland	9.37	9.31	9.67	9.77	8.73
9	United States	9.02	9.04	9.47	8.74	8.83
12	Germany	8.96	9.06	8.94	8.36	9.47
29	Korea, Rep.	7.82	6.00	8.60	8.09	8.60
54	Brazil	5.66	4.31	6.19	6.02	6.13
59	Argentina	5.57	2.78	6.89	6.64	5.96
81	China	4.47	3.90	5.44	4.20	4.33
109	India	3.09	3.50	4.15	2.21	2.49
<b>Income Groups</b>						
1	High Income	8.23	8.02	9.02	7.47	8.42
2	Upper Middle Income	5.66	5.08	6.03	5.63	5.89
3	Lower Middle Income	3.78	3.01	4.96	3.32	3.85
4	Low Income	2.00	2.05	2.52	1.61	1.82

Source: World Bank (2009)

# Conclusions

- Energy sector revolution. New technologies are needed.
- Governments should invest in the development of cleaner, affordable and more efficient energy technologies and processes.
- Developing countries should try to support local companies' efforts to become integrated into global value chains, instead of attracting foreign direct investment for exporting sectors.
- Emerging countries could enter into a path of innovation-based economic growth.
- It is needed one vision for all stakeholders
- Entrepreneurship culture is vital.
- Fostering innovation on a large scale will create an economy of knowledge.

# Not just a cover...



11.09.2010

**Thank you for your attention!**