



energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA



International
Energy Agency

Side Event (December, 6th 2011)

*New and Renewable Energy
Technologies – fostering
sustainable development and
Rural Electrification in Africa*



COP17/CMP7
UNITED NATIONS
CLIMATE CHANGE CONFERENCE 2011
DURBAN, SOUTH AFRICA

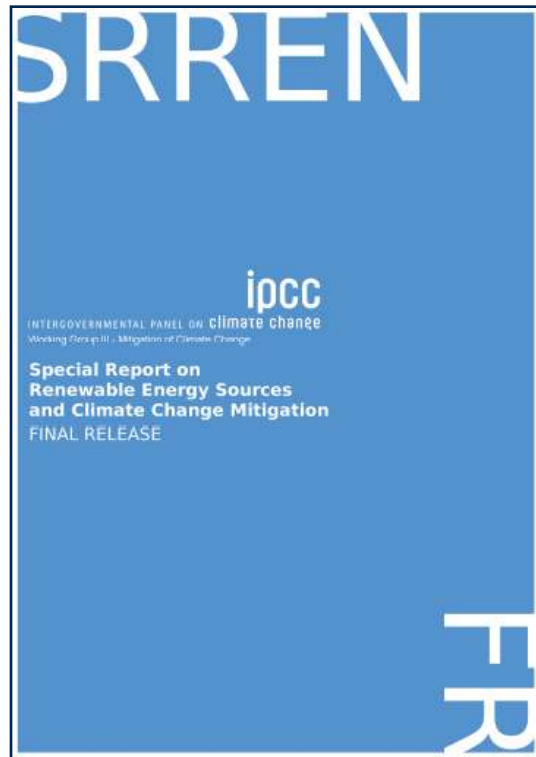
Perspectives on hydropower

Emmanuel BRANCHE

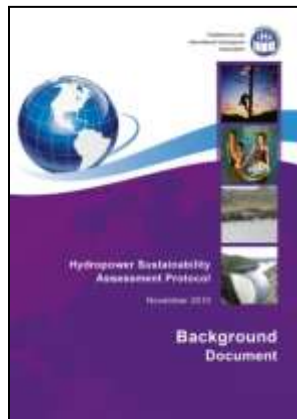


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Hydropower whatever the size is a renewable energy sources



Source: IPCC SRREN, 2011



“concepts like ‘small’ or ‘large hydro’ are not technically or scientifically rigorous indicators ... Hydropower projects cover a continuum in scale and it may ultimately be more useful to evaluate hydropower projects based on their sustainability or economic performance, thus setting out more realistic indicators”

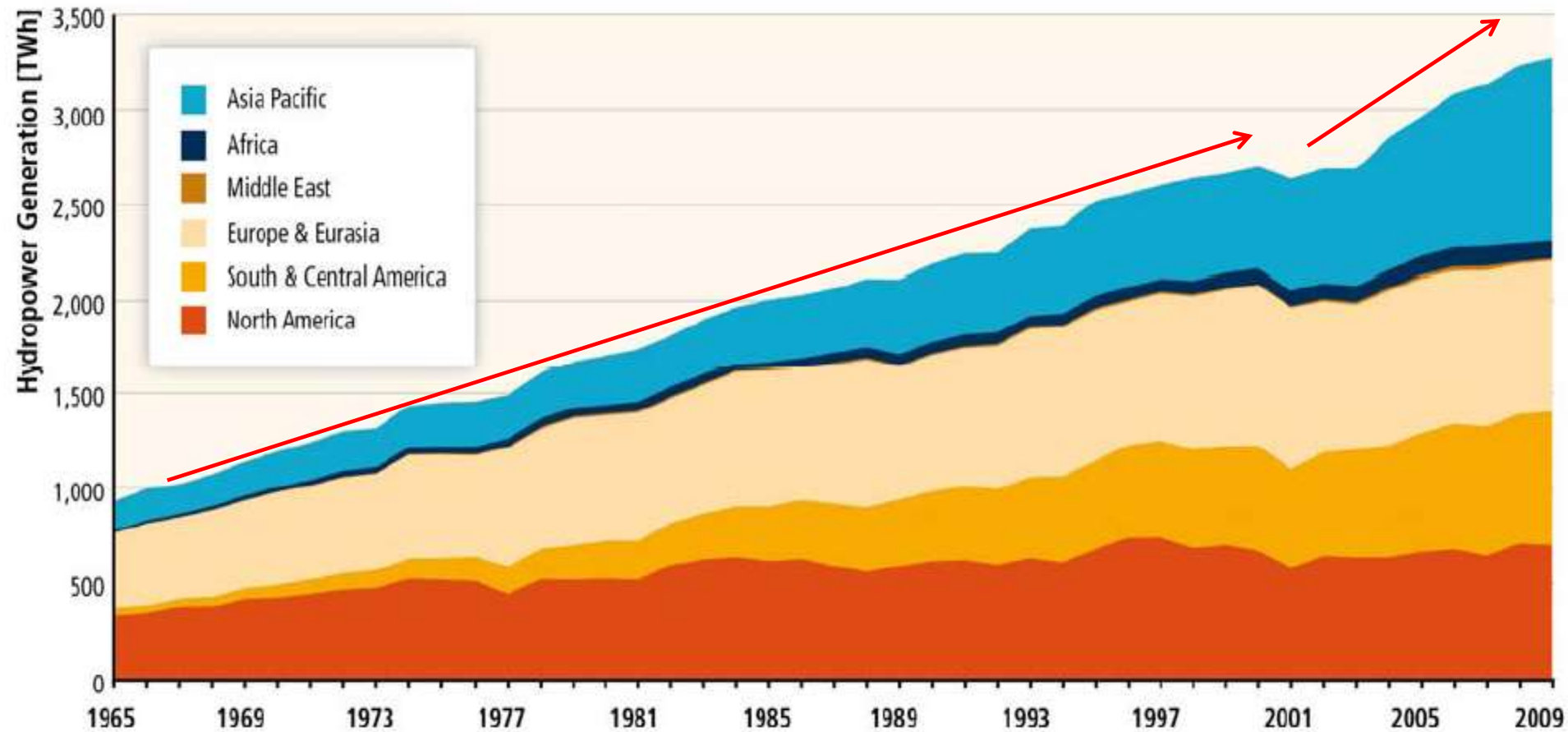
“In the past, hydropower has acted as a catalyst for economic and social development by providing both energy and water management services, and it can continue to do so in the future”

“Hydropower can provide important services to electric power systems”

“Hydropower offers significant potential for carbon emission reductions”

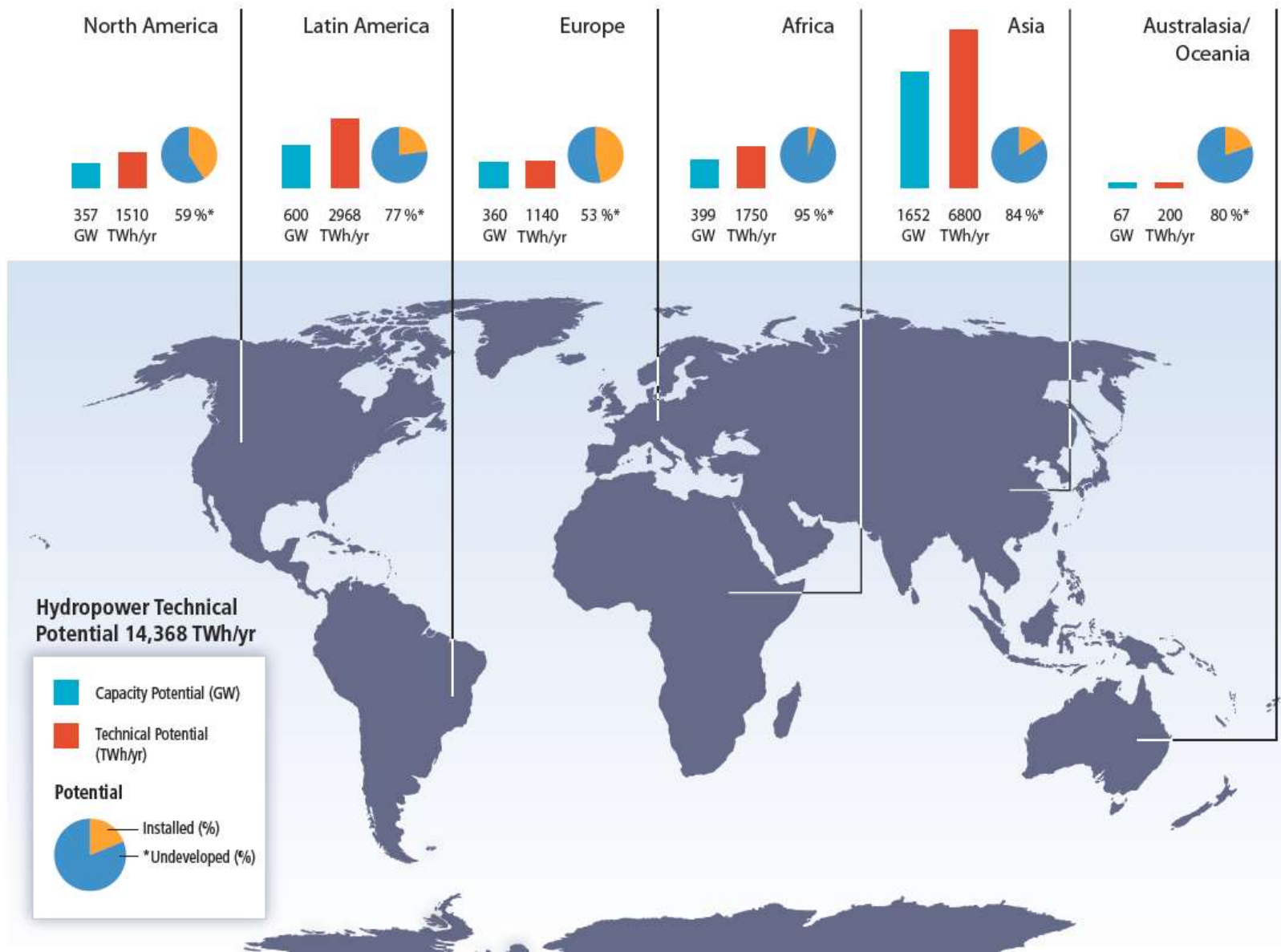
“Environmental and social issues will continue to affect hydropower deployment opportunities”

Hydropower growth has ramped up in recent years ... especially in Asia and Latin America



Source: IPCC SRREN, 2011

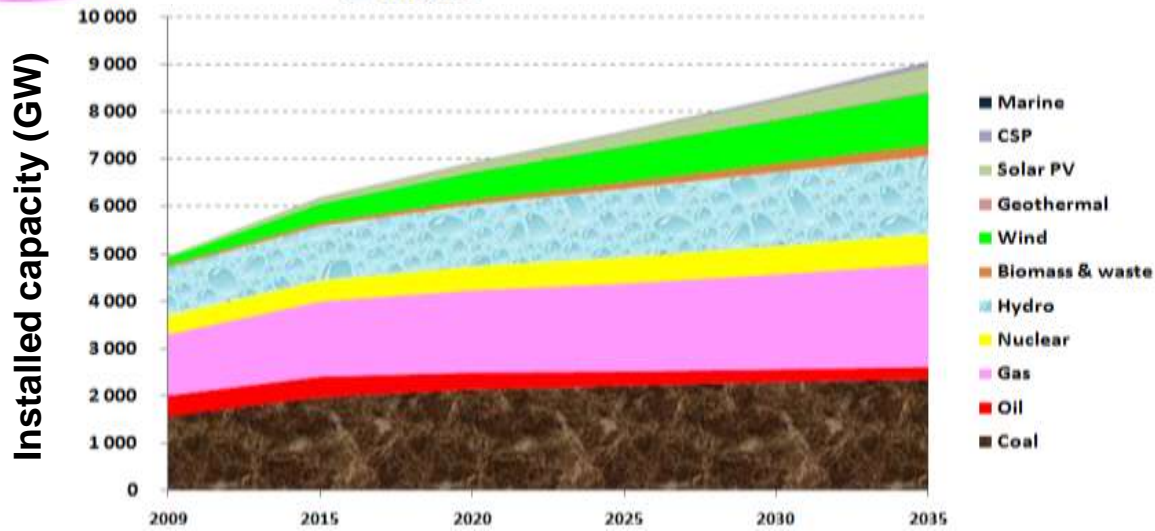
Yet only a quarter of the World's potential has been developed so far...



Source: IPCC SRREN, 2011

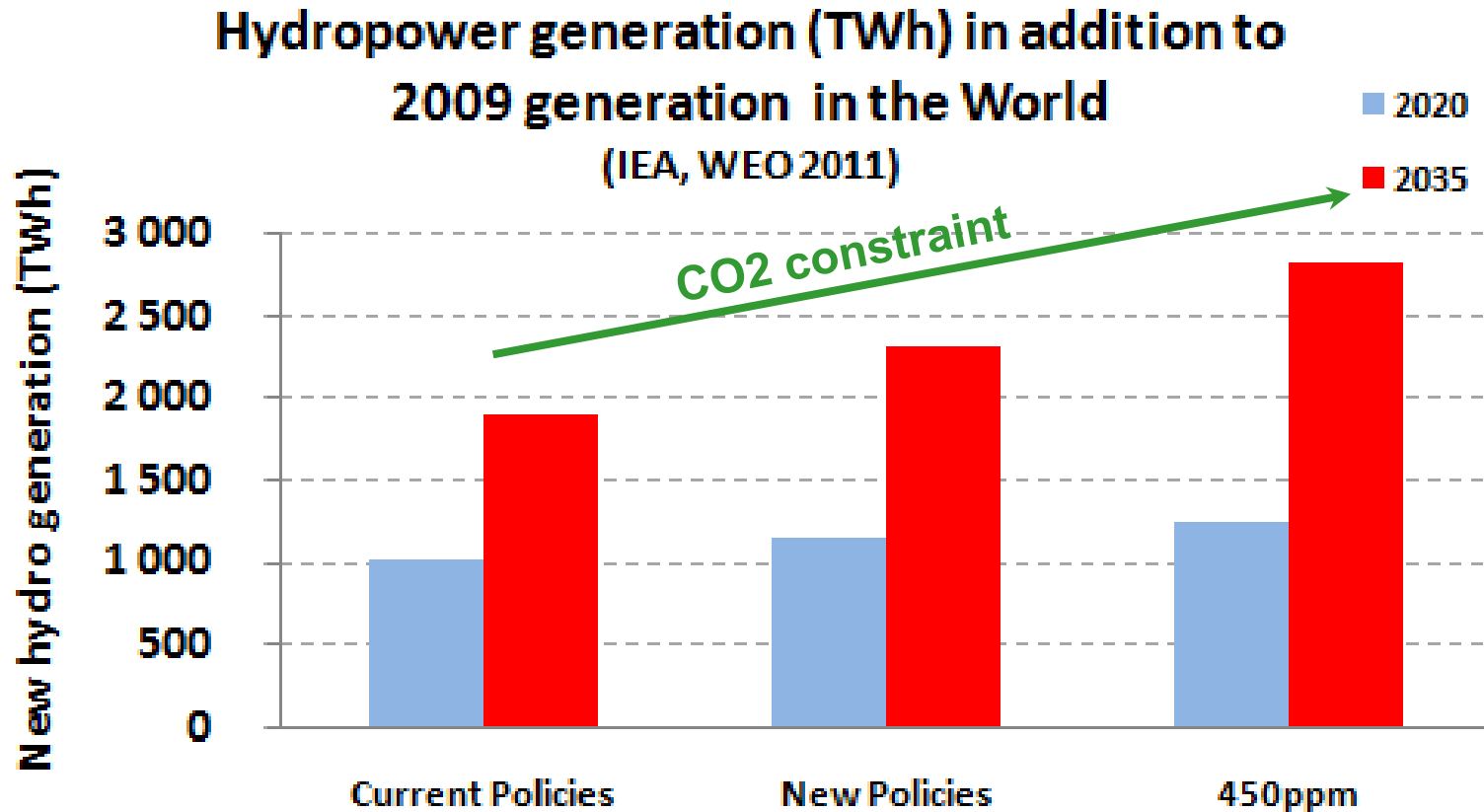
...therefore forecast hydropower deployment is substantial ...

World electricity mix



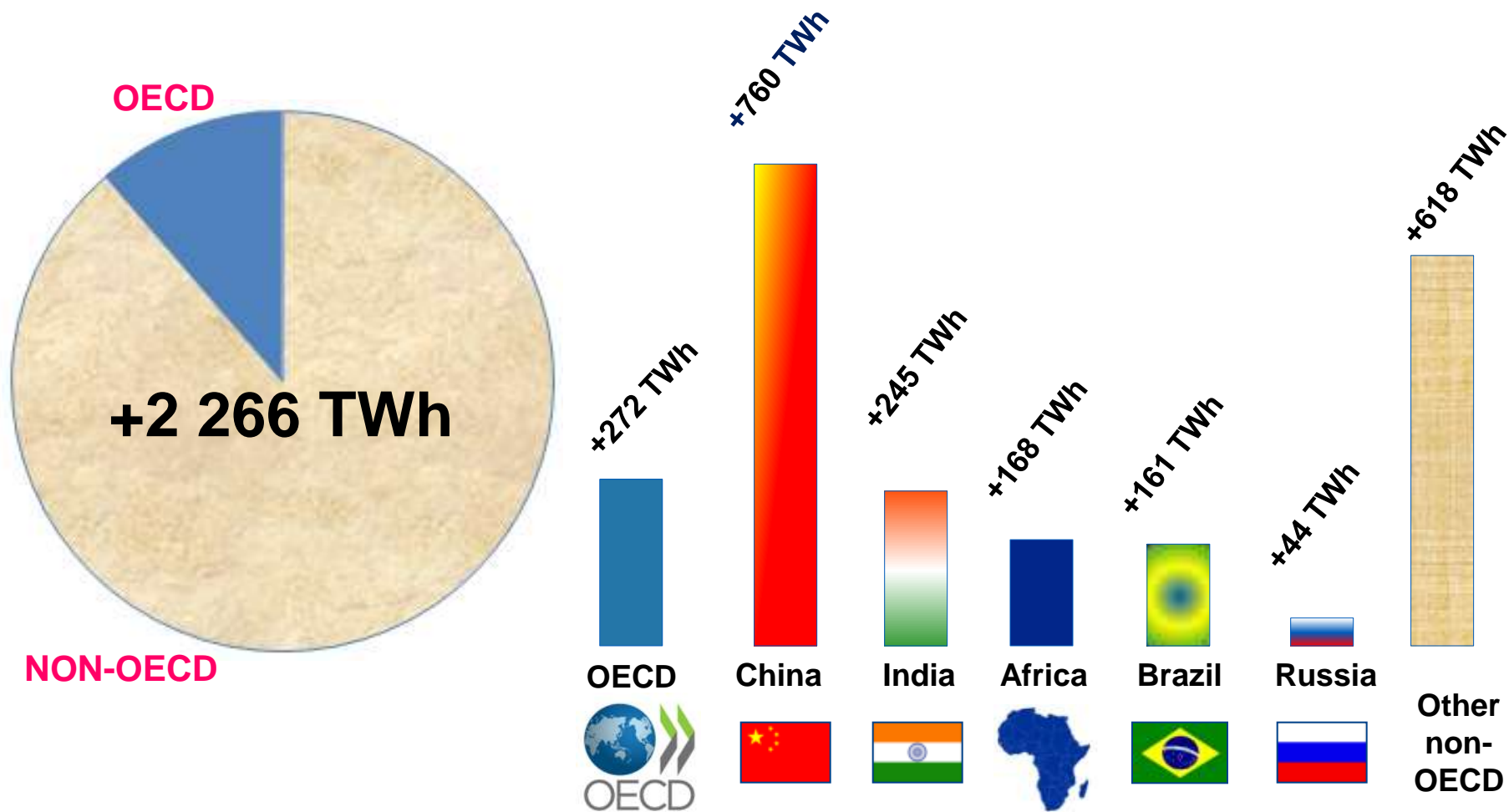
Source: IEA,
WEO2011 (New
Policies scenario)

...especially if carbon constraints are tightened!



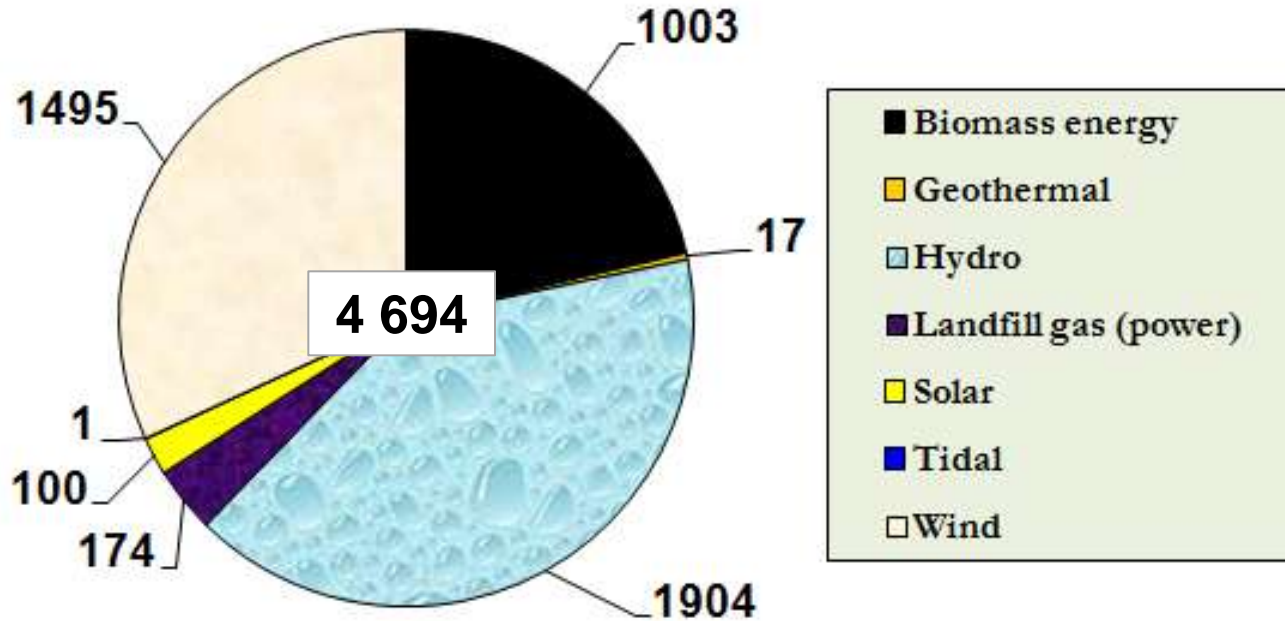
Source: IEA, WEO2011

...but mainly in non-OECD countries






Source: IEA, WEO2011 (New Policies scenario)

...in the meantime hydropower remains the leading technology in the CDM



Region	All hydro projects			
	Number		Installed capacity	
	Nb	%tot	MW	%tot
Africa	16	1%	802	1%
Asia & Pacific	1 595	84%	56 790	78%
Europe and Central Asia	18	1%	1 194	2%
Latin America	275	14%	14 108	19%
Total - World	1 904	100%	72 893	100%

-  China (1182 hydro projects ; 41 533 MW)
-  India (205 hydro projects ; 7 293 MW)
-  Brazil (117 hydro projects ; 6 596 MW)



New Hydropower Roadmap

- Role of hydro in IEA scenarios
- Roadmap goals, structure and process
- Key findings
- Financial issues
- Policy framework: overcoming financial issues
- Conclusions

IEA, Renewable Energy Division



Roadmap goals, structure and process

- ◆ In 2008 G8, China, India and South Korea asked the IEA to prepare a series of roadmaps
- ◆ Rationale: accelerate the development of *advanced energy technologies*:
 - address the global challenges of clean energy
 - climate change
 - sustainable development
- ◆ This Hydropower Roadmap is a joint effort of the IEA, the Ministry of Mines and Energy of Brazil, the IEA Hydropower Implementing Agreement and CEPEL.



New IEA Roadmap: hydropower. Ready in 2012

◆ Discover status and potentials

- Technology
- Economics
- Opportunities

◆ Identify barriers and actions needed

- Policy
- Sustainability and *appropriation*
- Finance

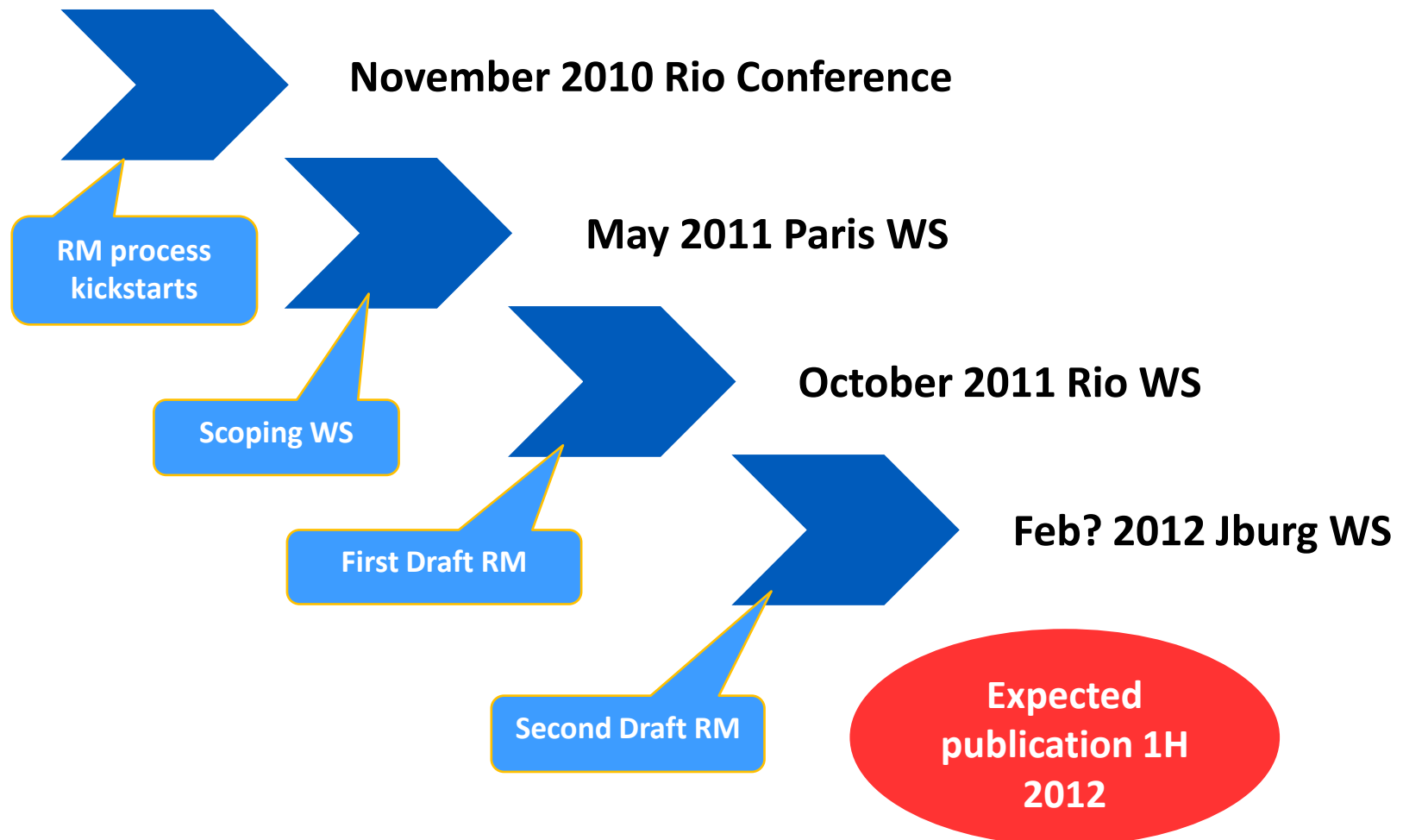
◆ Partners: IEA, IEA Hydropower implementing Agreement and the Government of Brazil

◆ Milestones: April 2011 Paris WS. October 2011, Rio WS. Early 2012 Jo'burg WS.

Roadmap process

carlos.gasco@iea.org

▶ A process open to stakeholders

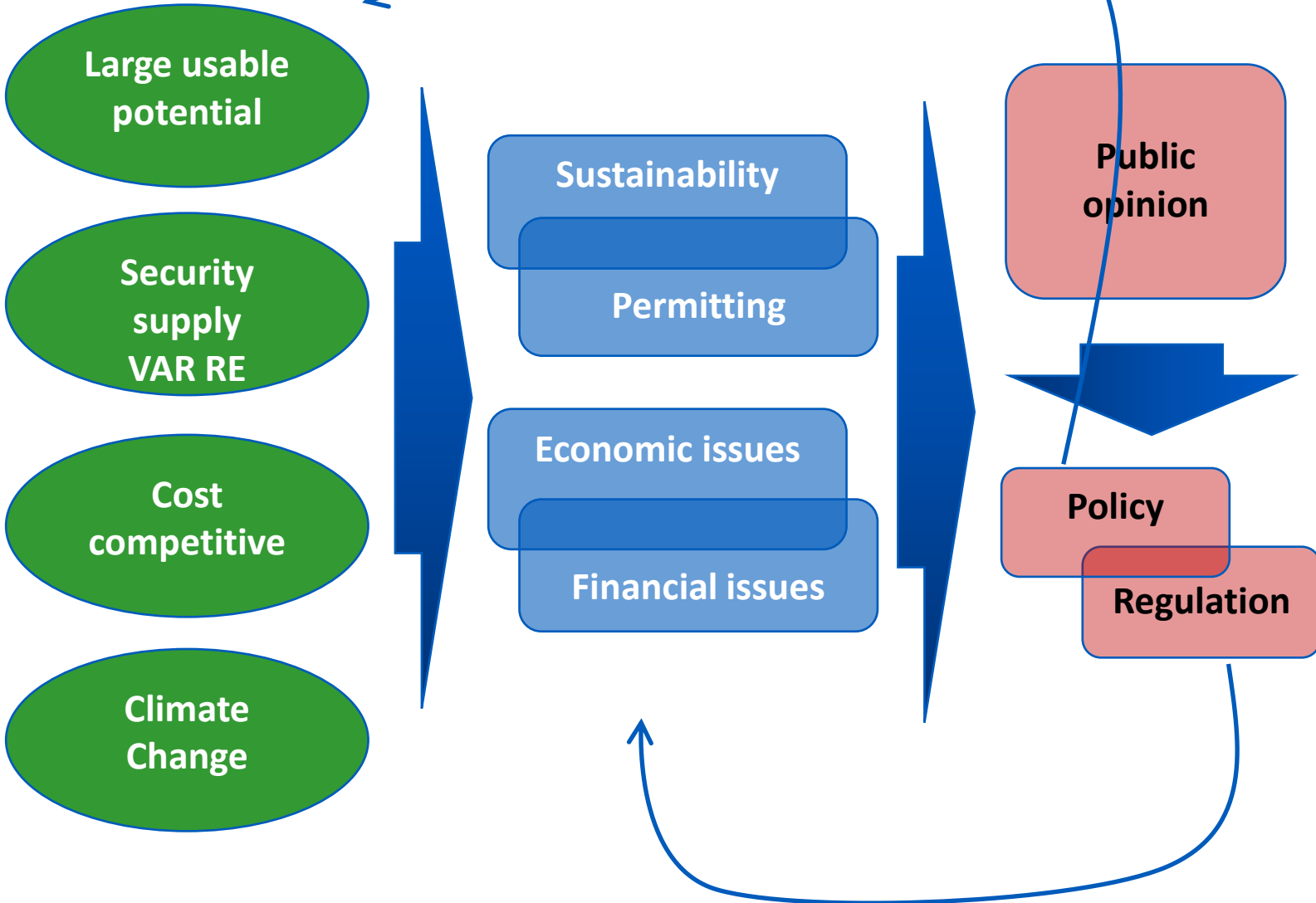


Roadmap structure

- ◆ Key Findings
- ◆ Key Actions : next ten years
- ◆ Hydropower Status Today
- ◆ Vision for Hydropower Deployment
 - Future of hydropower in the energy mix
- ◆ Sustainability of hydropower and river basin management
 - Environmental
 - Social
 - Economic
 - Different uses for water
- ◆ Managing and improving existing facilities
 - Management and operation
 - Installations
- ◆ Financial challenges
- ◆ Technology Milestones
- ◆ Policy Framework: Roadmap Actions and Milestones
 - Addressing sustainability and use of water
 - Hydropower and grid integration of variable renewable
 - Overcoming financial barriers
- ◆ Conclusions: Near-term actions and stakeholders' role



Key Findings





Conclusions

- ▶ **Hydropower plays a major role in all scenarios**
 - Even in the Current Policy Scenario
 - Most importantly in the 450 Scenario
 - Very large shares in some regions/countries
- ▶ **Dispatchable hydropower can help the deployment of other renewable power sources**
 - Notably variable RE like wind and solar PV
- ▶ **Sustainability is the key**
 - Renewable is not always sustainable
- ▶ **IEA and partners working on a key publication**

Thank you for your attention!



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Emmanuel BRANCHE

Senior Engineer Economist

Generation & Engineering

Sustainable Development Department

Savoie Technolac

73373 Le Bourget du Lac Cedex – FRANCE

Phone : +33 (0)4 79 60 64 26

Mobile : +33 (0)6 47 86 35 65

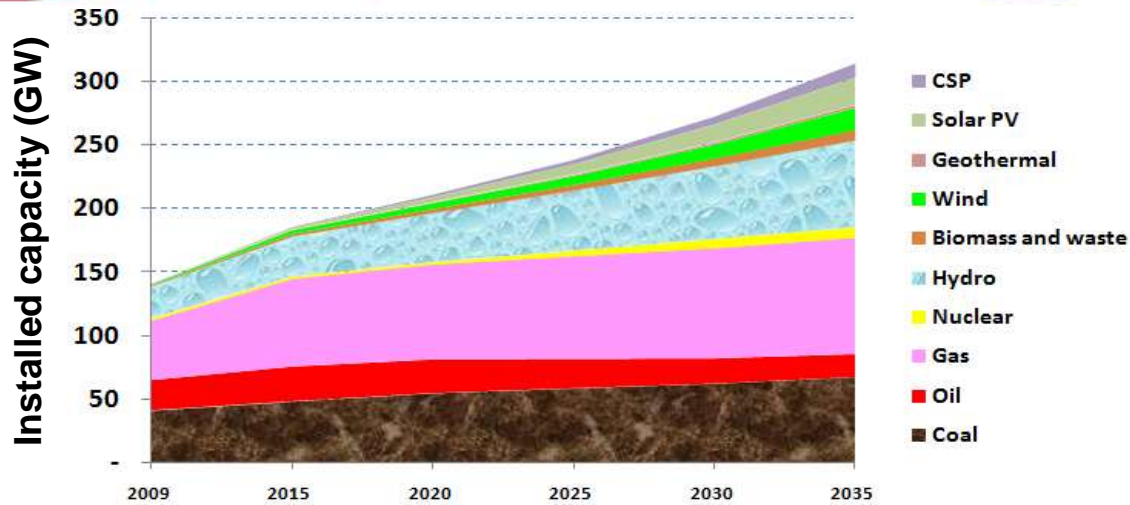
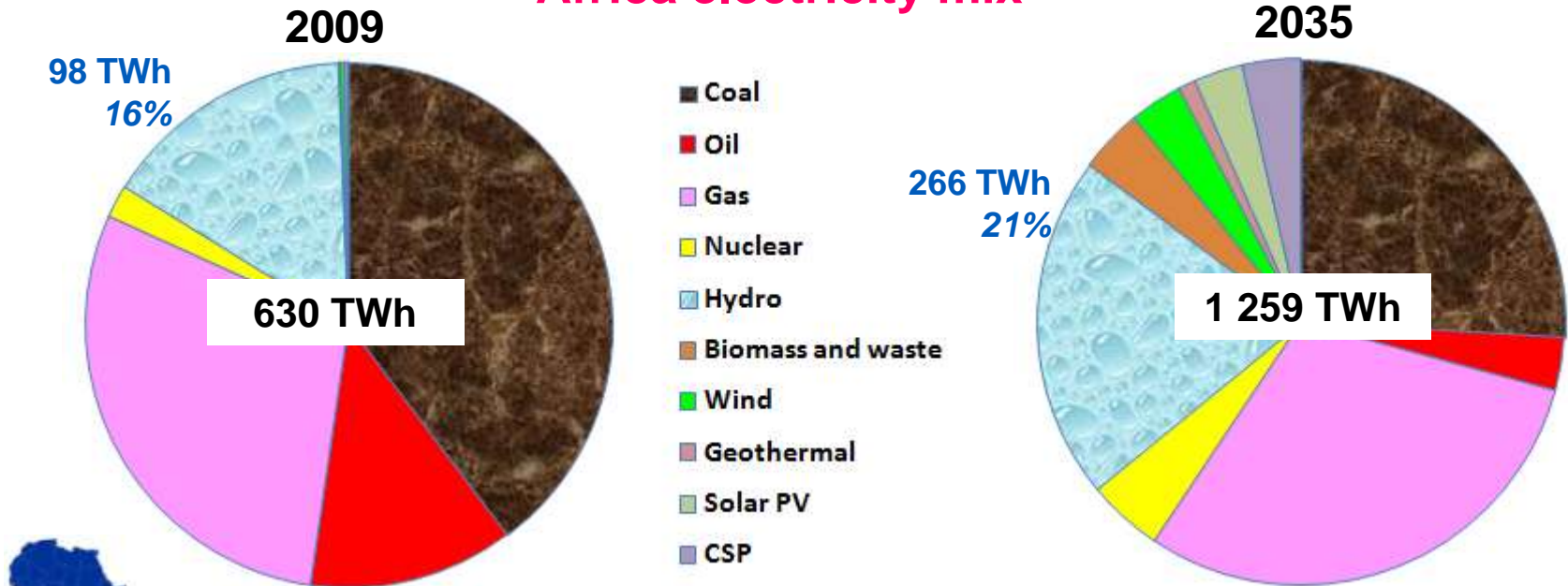
Fax : +33 (0)4 79 60 35 65

E-mail : emmanuel.branche@edf.fr

www.edf.fr

In Africa hydro is expected to triple its installed capacity

Africa electricity mix



Source: IEA, WEO2011 (New Policies scenario)

Economic and Financial issues

▶ Issue # 1: asset revenue stream

- *Regulatory risk:*
 - returns attained after very long periods
- *Market risk.* Price signalling and market desing:
 - value of system services vs. Kwh
 - value of avoided emmisions
- *Other risks, geographical*
 - Intenational conflict, political change, meteorological...

Economic and Financial issues

■ Issue # 2: upfront investment costs

- Very large capex
- Long permitting periods
- Long construction periods

- Tight financial market conditions
- Risk averse *private* investors

Economic and Financial issues

■ Issue # 3: capital availability

- Are there adequate financial instruments for hydro?

■ Policy actions

- Identify and reduce perceived risk
 - ◆ Cost overruns and delays
 - ◆ Revenue stream
- Make *more* capital available

Overcoming financial issues

- **(Re) examine the role of agents**

