
Energy Trading:

Experiences of Energy Integration in the EU Africa and Central America

The GMS Power Integration Perspectives

Prof. Thierry Lefèvre, Director
Mr. Francois Lefèvre, Senior Research Associate
Centre for Energy Environment Resource Development (CEERD)

1. Energy Integration in the EU – Present Situation and Future Prospects

1. Context
2. The three challenges
3. The EU response
4. External energy policy aspects
5. EU energy relations with Asia

2. Power Integration and Trade in the Rest of the World (examples)

1. Nordic Power Market
2. Central America Market
3. African Power Pool Organizations
 - ✓ SAPP
 - ✓ WAPP
 - ✓ CAPP
 - ✓ EAPP
 - ✓ African Electricity Market

3. Power Trade in the GMS (Introduction to ADB GMS RETA 6440)

Note: A number of slides come from DG Energy and Transport, European Commission presentations which took place in Hanoi, April 2008 at the occasion of the ASEM Forum on Energy Security.

Disclaimer: The content of this presentation is the sole responsibility of CEERD and can under no circumstances be regarded as reflecting the position of the European Union.

1. Energy Integration in the EU

- 1.1 Context**
- 1.2 The three challenges**
- 1.3 The EU response**
- 1.4 External energy policy aspects**
- 1.5 EU energy relations with Asia**

1. Energy Integration in the EU

1.1 Context

1.2 The three challenges

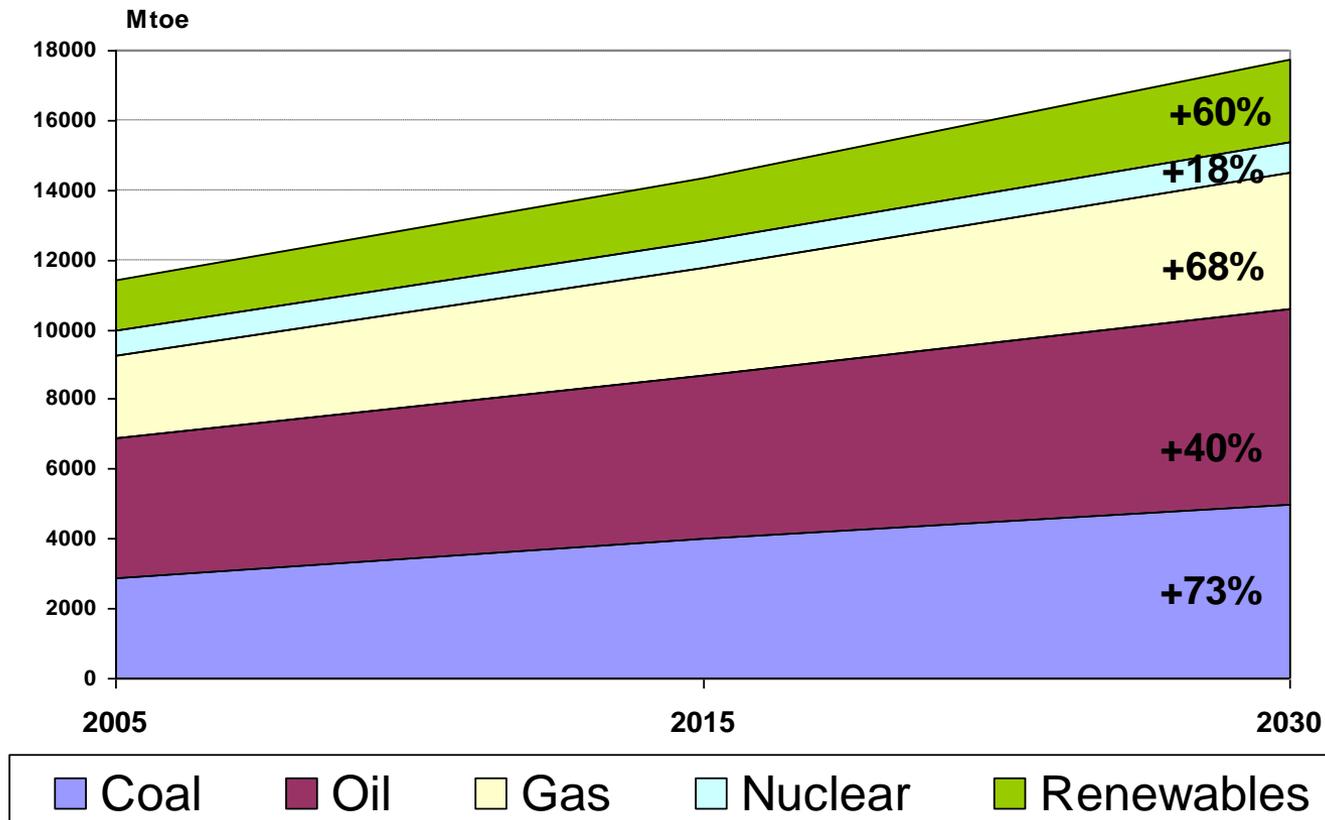
1.3 The EU response

1.4 External energy policy aspects

1.5 EU energy relations with Asia

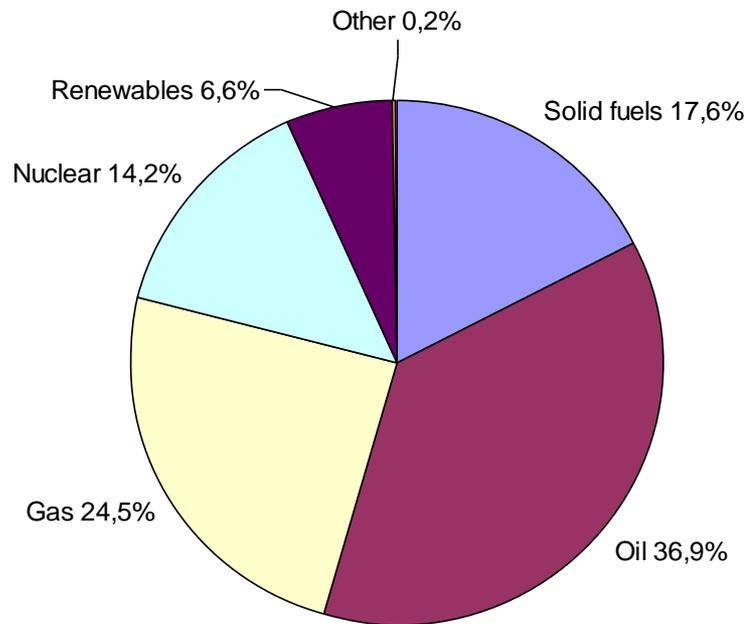
1.1 Context: World Energy demand

Total energy demand up by 55% in business as usual between 2005 and 2030

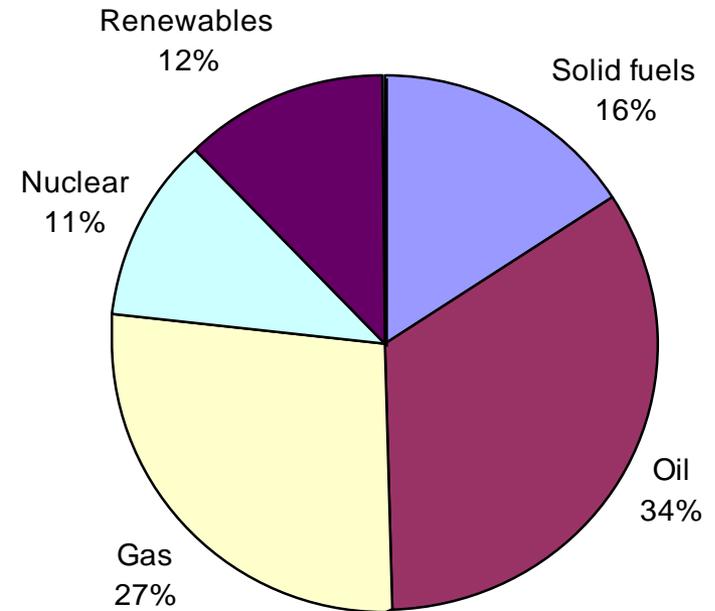


1.1 Context: EU energy mix

**EU-27 ENERGY MIX: High dependence on fossil fuels
=> Business as usual is **NOT SUSTAINABLE****



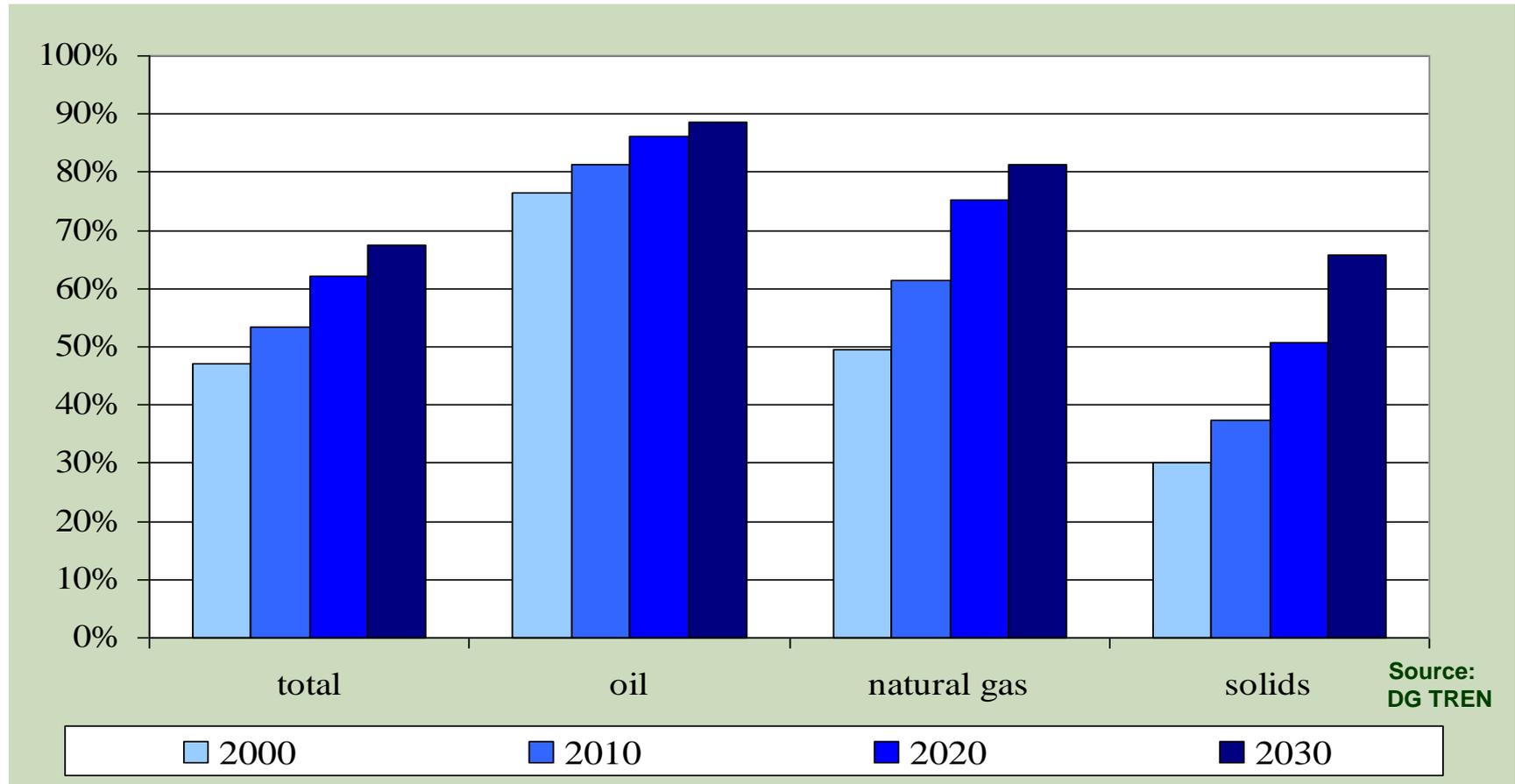
2005



2030 (BaU)

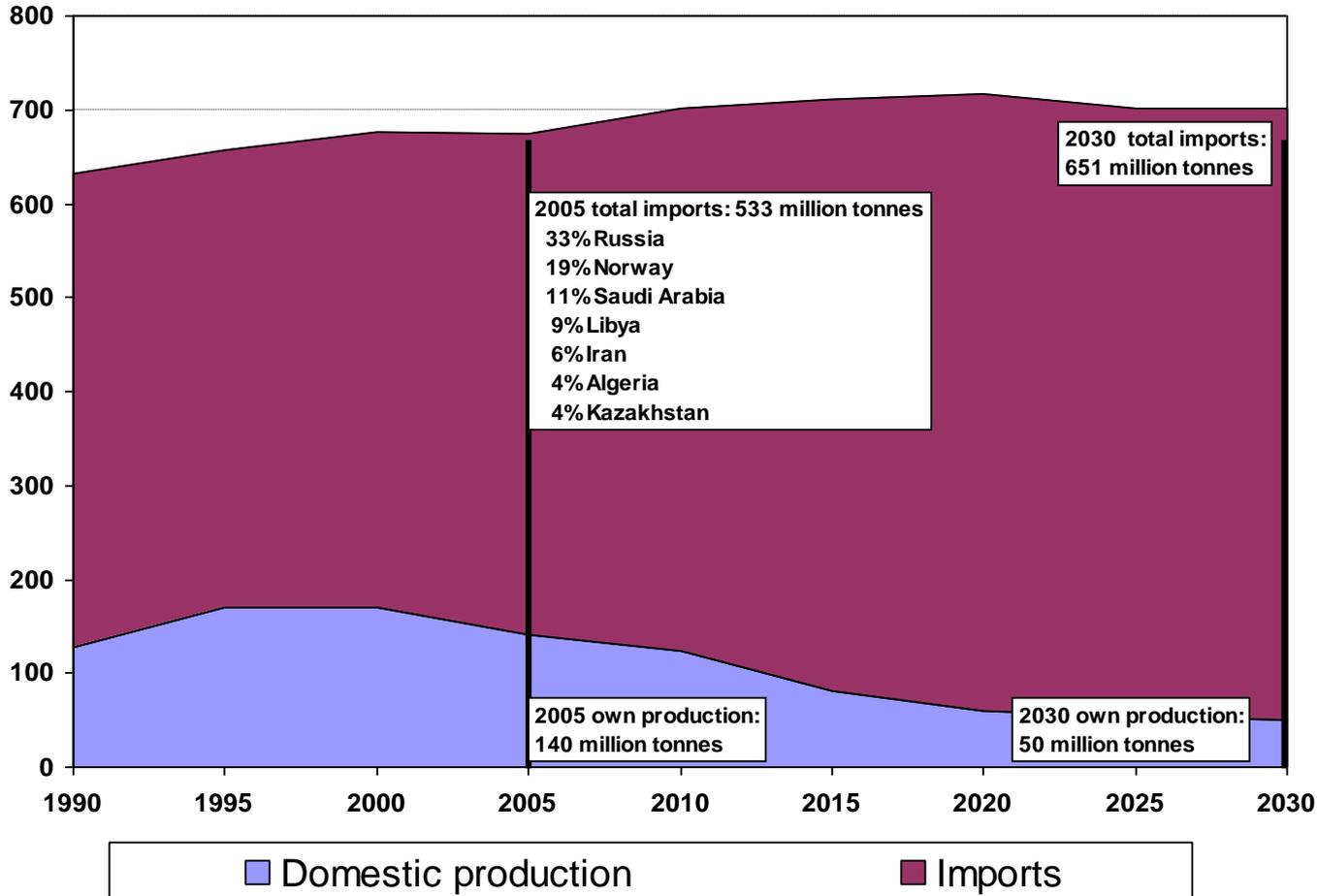
Source: DG TREN/EUROSTAT

Anticipated growth in the EU's import dependency



1.1 Context: OIL: EU-27 Oil demand

Reserves concentrated in the Middle East but a global market



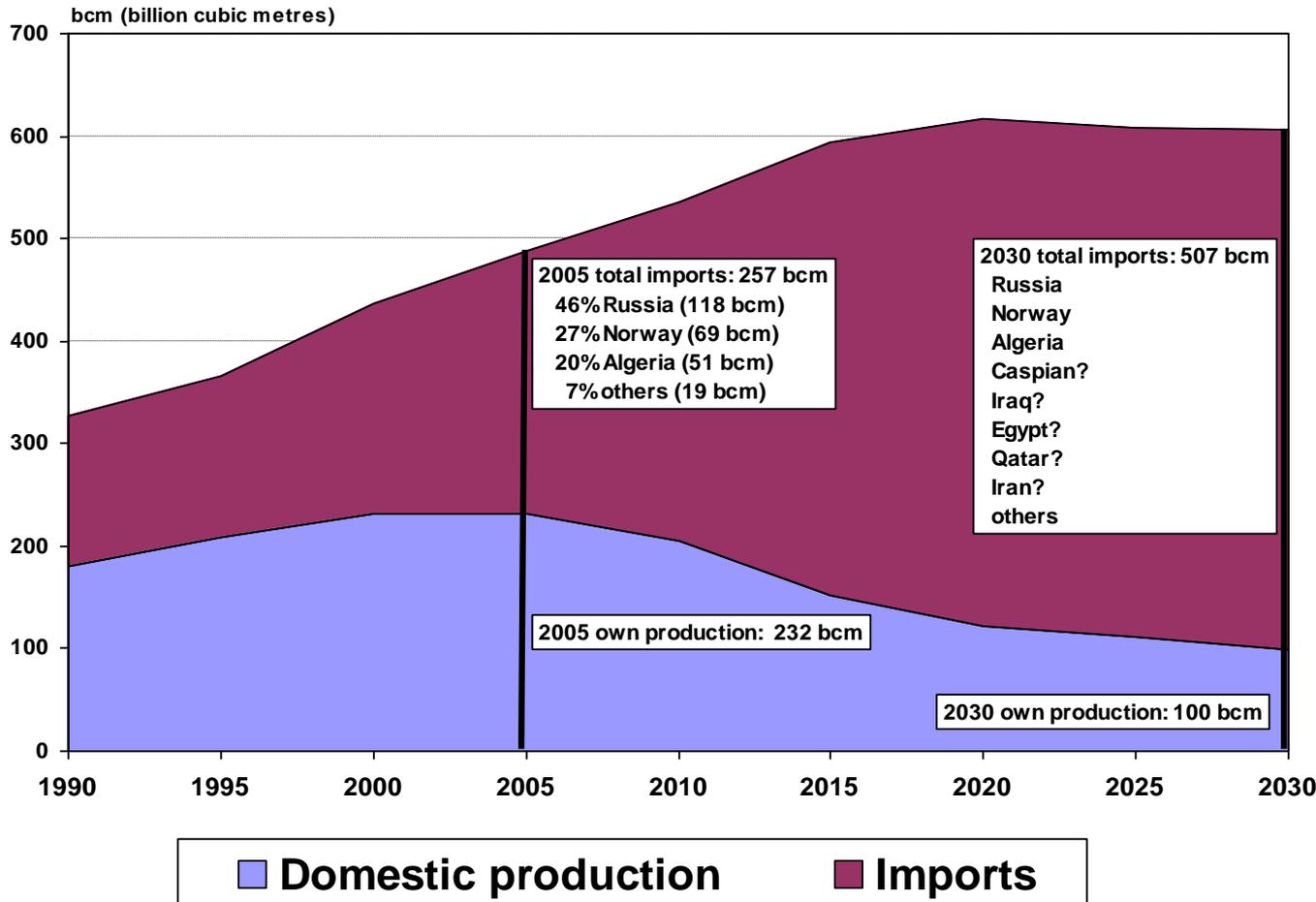
Proven reserves:
 Saudi Arabia 22%
 Iran 11.5%
 Iraq 9.5%
 Kuwait 8.5%
 UAE 8%
 Venezuela 6.5%
 Russia 6%
 Central Asia+Caspian 4%*
 Libya 3%
 Nigeria 3%
 Others 17.5%

Note: True Central Asian reserves are unknown – still using old information

Challenges
 Transport sector
 Russia
 Caspian
 Middle East

1.1 Context: GAS: EU-27 gas demand

EU production halves, imports double to 2030. Where will the imports come from?



Proven reserves:

- Russia 26%
- Iran 15%
- Qatar 14%
- Central Asia+Caspian 5%*
- Saudi Arabia 4%
- UAE 3.5%
- USA 3%
- Nigeria 3%
- Algeria 2.5%
- Venezuela 2.5%
- Others 21%

Note: True Central Asian reserves are unknown – still using old information

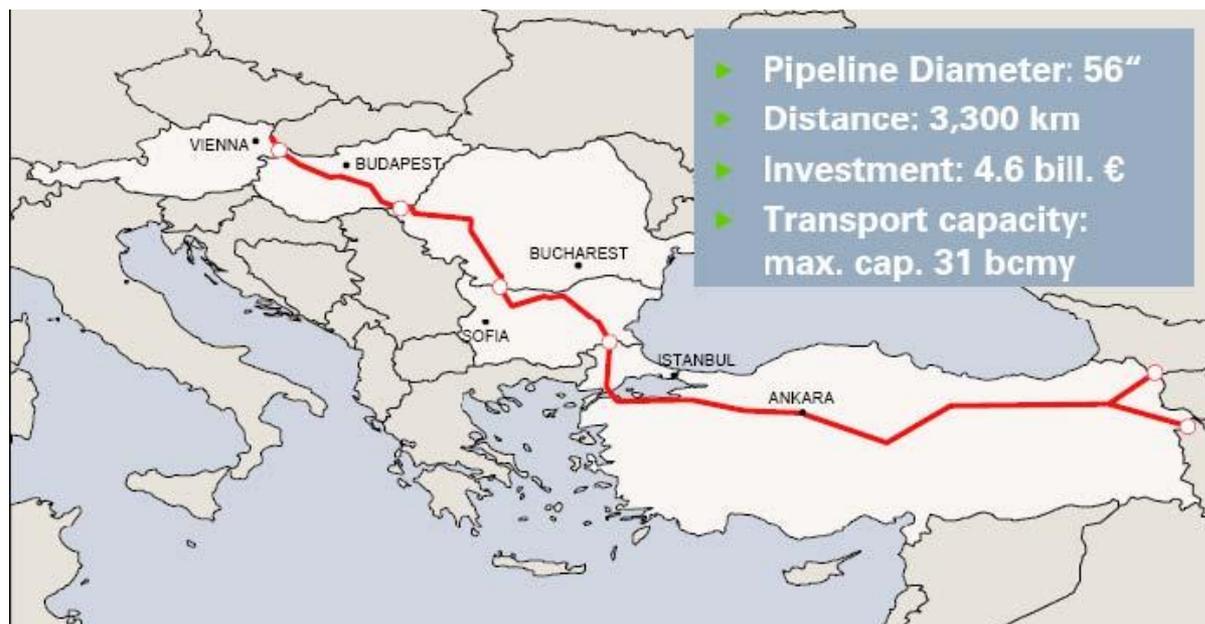
Challenges

- Can Russia supply?
- Importance of networks.
- LNG?

1.1 Context: GAS: Nabucco pipeline

The Nabucco pipeline will be connected with the Tabriz (Iran) - Erzurum pipeline, and with the South Caucasus Pipeline, connecting the Nabucco Pipeline with the planned Trans-Caspian Gas Pipeline.

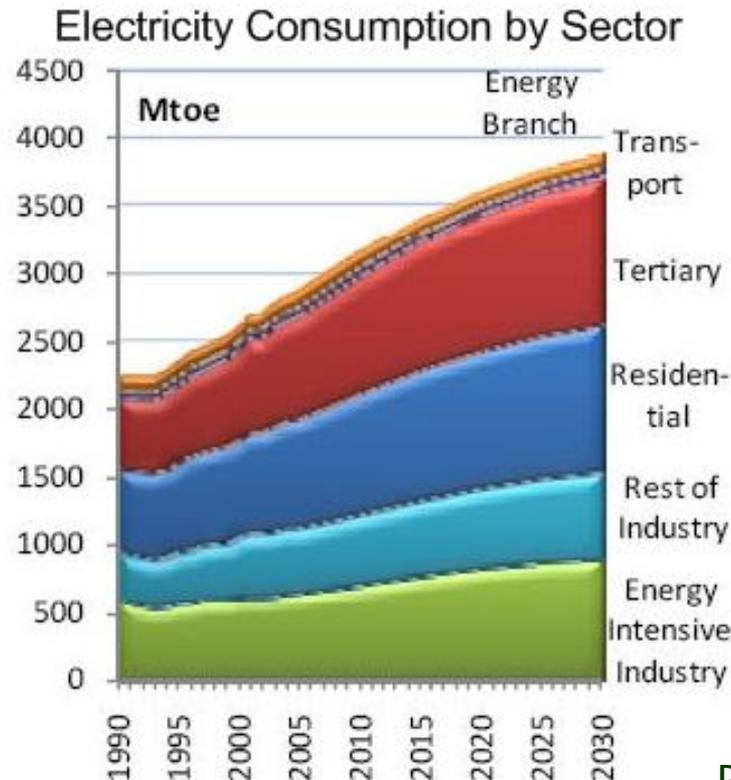
Once completed, it will allow transportation of natural gas from producers in the Middle East and Caspian region such as Iran, Azerbaijan and Turkmenistan, to Western Europe and to the countries along its path.



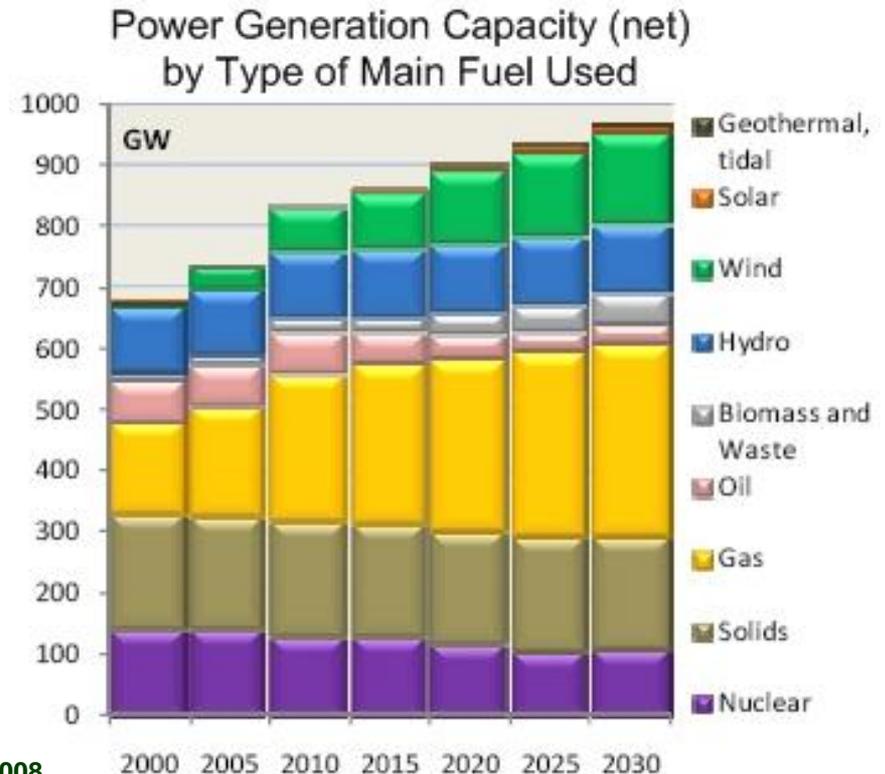
Source: MVV Consulting, 2007

With construction due to start in 2008, total transport capacity should reach 31 Bcm/y with 16 Bcm/y arriving in Austria by 2020.

1.1 Context: ELECTRICITY: EU-27 demand



Source:
DG TREN, 2008



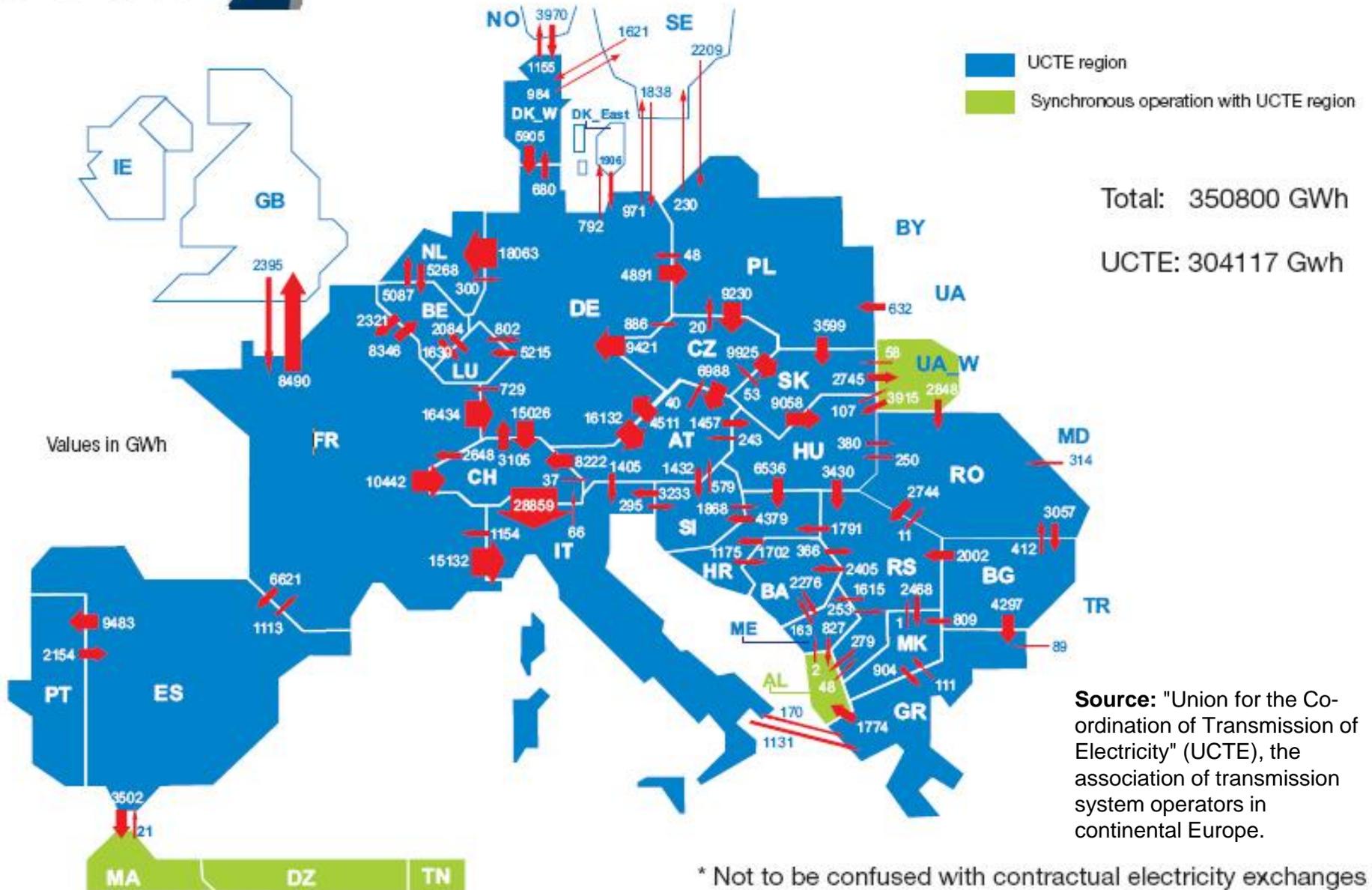
Electricity represents 23% of total final energy demand in 2030, compared to 17% in 1990 and 20% in 2005.

Total net power capacity is projected to increase by 31% between 2005 and 2030 in order to meet power load.

UCTE

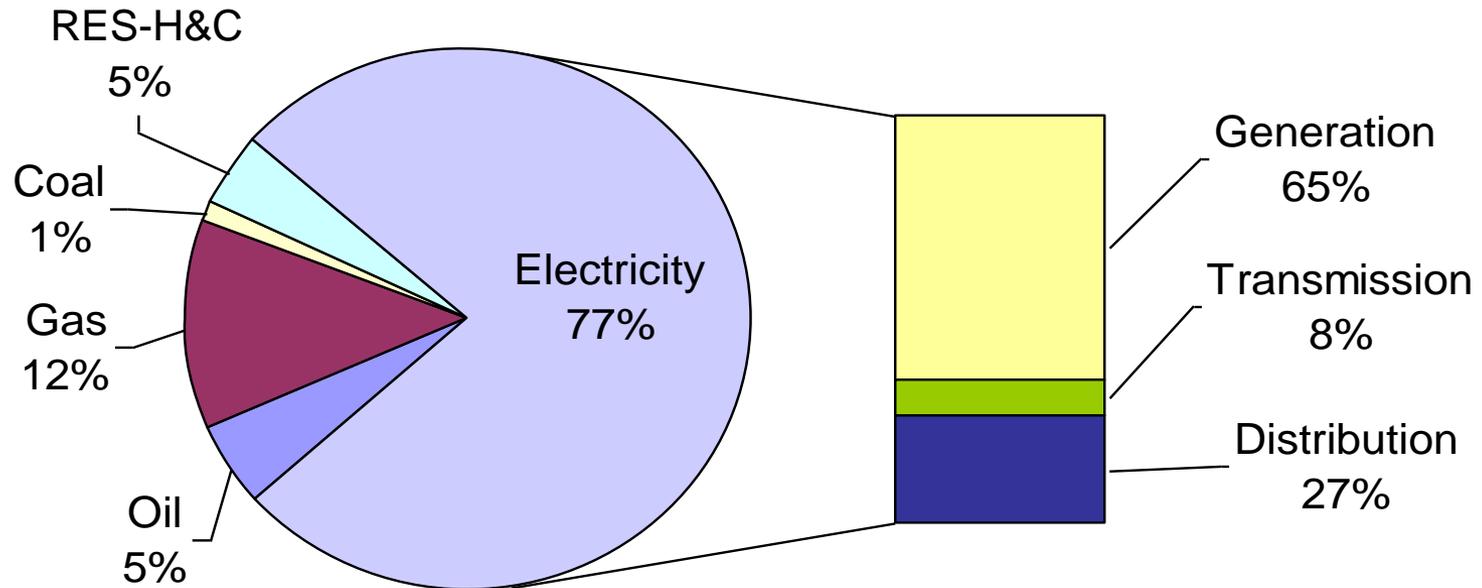


Physical energy flows 2007 *



1.1 Context: The need for investments

EU-27 INVESTMENT NEEDS up to 2030: €1.79 trillion



Source: DG TREN/EUROSTAT

1. Energy Integration in the EU

1.1 Context

1.2 The three challenges

1.3 The EU response

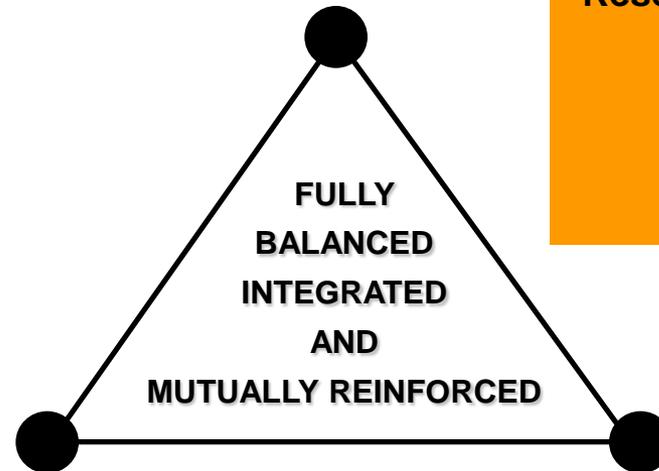
1.4 External energy policy aspects

1.5 EU energy relations with Asia

1.2 The Three Challenges

Competitiveness

- Internal Market
- Interconnections (Trans-European networks)
- European electricity and gas networks
- Research and innovation
 - Clean coal
 - Carbon sequestration
 - Alternative fuels
 - Energy efficiency
 - Nuclear



Sustainable Development

- Renewable energy
- Energy efficiency
- Nuclear
- Research and innovation
- Emission trading

Security of supply

- International Dialogue
- European stock management (oil/gas)
- Refining capacity and energy storage
- Diversification

Source: DG TREN

1. Energy Integration in the EU

- 1.1 Context
- 1.2 The three challenges
- 1.3 **The EU response**
- 1.4 External energy policy aspects
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1.3 The EU response: Acting together

- 1) Fully realising the Internal market for electricity and gas, and improving interconnections
- 2) Making EU solidarity a daily reality
- 3) Strong measures to improve energy efficiency
- 4) Longer term and binding targets for renewables
- 5) A strategic approach to energy technology, with a priority for low carbon technologies
- 6) A clear perspective on nuclear
- 7) A common external energy policy and a common voice in negotiations with partners

1.3 The EU response: An integrated EU energy market

Policy Actions for enhancing the physical integration of EU Energy Infrastructure with:

- Continuous identification of missing infrastructure;
- European coordinators intervene for 4 priority projects:
 - Power-Link Germany, Poland, Lithuania,
 - Connections to off-shore wind power Northern Europe,
 - Electricity interconnections France-Spain,
 - Nabucco pipeline;
- Trans-European Energy Networks (TEN-E) projects of “European interest” (PEI). A time span of five years for planning and approval procedures should be the maximum;
- Increased funding of Trans-European Energy Networks.

1.3 The EU response: An integrated EU energy market

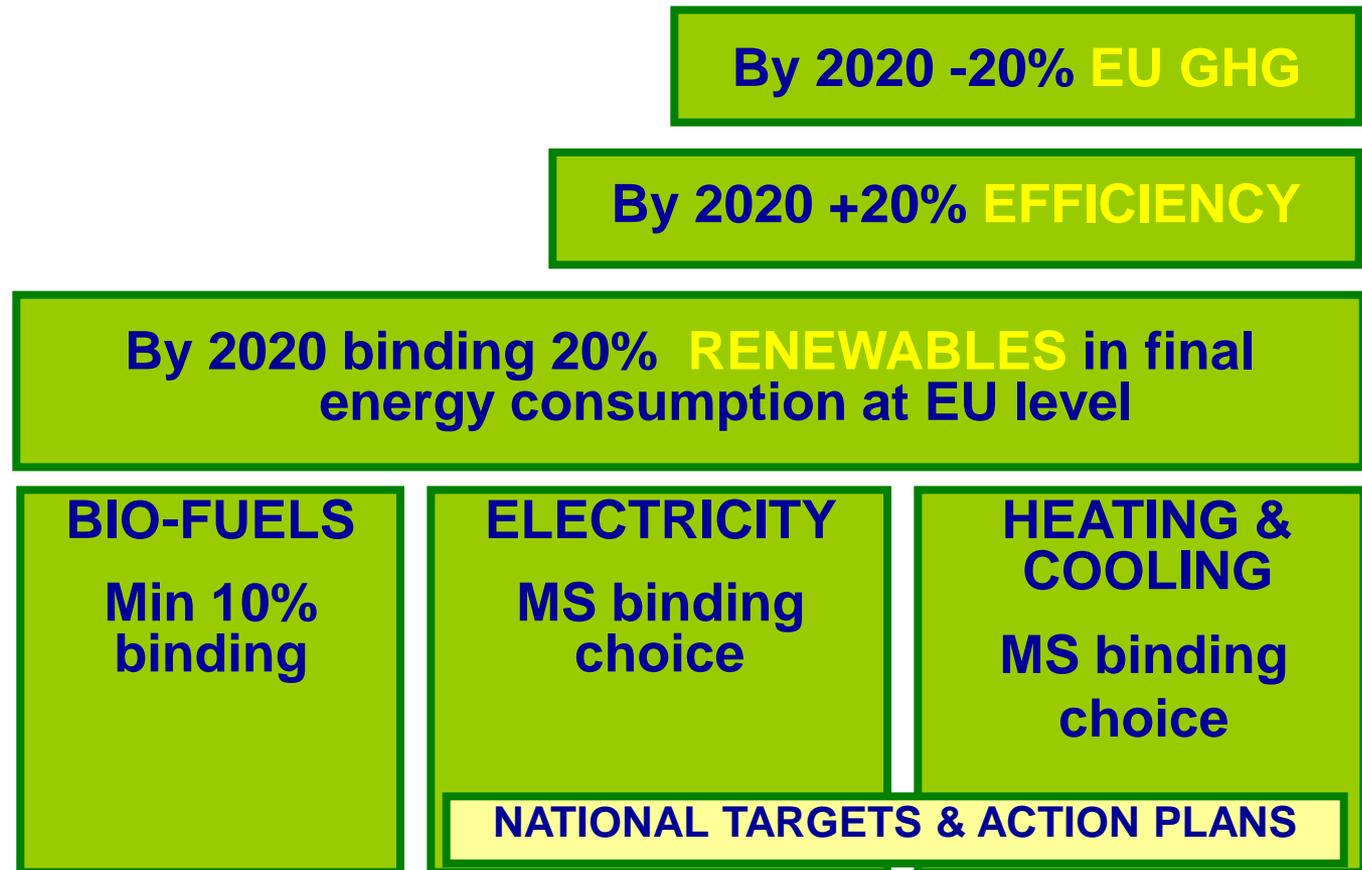
Policy Actions for further integrating the EU market:

- Ensuring the full implementation of the EU's legislation in the energy sector;
- Non-discriminatory access to networks through unbundling;
- Enhancing the role of national regulators and reinforcing co-ordination at an EU level;
- Interconnection: more co-ordination between the Transmission System Operators (TSOs).

1.3 The EU response: Consultation and solidarity

- **A fully functioning EU-wide internal energy market is the best guarantee of supply security.**
- **EU Network of Energy Security Correspondents**
- **EU Gas Coordination Group**
- **EU Oil Supply Group**
- **Communication foreseen on security of supply (strategic stocks, effective mechanisms for energy crisis management)**

1.3 The EU response: Energy Efficiency & Renewables



1.3 The EU response: Technology co-operation

STRATEGIC ENERGY TECHNOLOGY PLAN

Technology for a low carbon future

- **To focus, strengthen and give coherence to the overall energy technology efforts across the EU**
- **Identification of 6 priority industrial initiatives:**
 - **Sustainable coal and gas, particularly carbon dioxide capture and storage;**
 - **Smart electricity grid, including storage;**
 - **Second generation biofuels: use of catalysts vs. fermentation (bacteria);**
 - **Photovoltaic – large scale demonstration;**
 - **Large-scale offshore-wind;**
 - **Generation IV fission power, fusion energy.**

1.3 The EU response: Future of Nuclear

Nuclear Energy represents at present:

- Around 1/3 of the electricity and 15% of the EU energy mix
- CO₂-free source with importance in low emission scenarios
- Concerns on nuclear waste and decommissioning

Policy Actions:

- Sustainable Nuclear Energy Technology Platform (SNE-TP) to overcome fragmentation and to better coordinate research;
- High Level Group (HLG) mandated to seek consensus on further improving nuclear safety and safe waste management at a European level;
- European Nuclear Energy Forum, which aims for the first time at an inclusive and wide-ranging stakeholder discussion on the opportunities and risks of using nuclear energy in a low carbon energy mix.

1. Energy Integration in the EU

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- 1.4 **External energy policy aspects**
- 1.5 EU energy relations with Asia

1.4 External energy policy: Speaking with one voice

What is the objective?

- To ensure a reliable, competitive and sustainable flow of energy to the EU.

What are the possible external risks?

- Risk of external geopolitical or commercial disputes affecting energy flows;
- Exposure of crucial external energy infrastructure to disruptions caused by a variety of reasons, including lack of effective maintenance or investment, adverse climatic conditions or a terrorist threat;
- Danger of external suppliers adopting anti-competitive practices on, or with respect to, the EU's internal energy market;
- Unforeseen events, be they political, economic or environmental.

1.4 External energy policy: Objectives

- Diversification of energy imports by fuel, by source and by transportation route,
 - Promoting the development of production and export capacities in producer countries in a safe and secure environment,
 - Promoting the upgrade of existing and the development of new energy transportation infrastructures by producer and transit countries,
 - Improvement of the investment conditions in third countries,
 - Improvement of the conditions for energy trade, including non-discriminatory transit and third party access to the export pipeline infrastructures,
 - Promoting the highest levels of physical and environmental safety and security of energy infrastructures and the highest standards of nuclear safety,
 - Encouragement of energy efficiency and energy savings in third countries, as well as the promotion of the relevant Kyoto Protocol mechanisms.
-

1.4 External energy policy: Actions

Russia : Energy Dialogue since October 2000.

Ukraine: MoU on energy cooperation signed in December 2005.

Norway: Dialogue since Spring 2002.

Kazakhstan & Azerbaijan: MoU's signed in 2006.

Turkmenistan & Uzbekistan: MoU's under preparation/planned.

Morocco & Jordan: Declarations on energy cooperation.

Algeria & Egypt: MoU's being negotiated.

South-East Europe: Energy Community in place between the EU and the countries of South East Europe*.

US, China, India, Japan, Brazil, ASEAN: Energy dialogues underway.

ASEM: Energy Security Forum – Vietnam 11 April 2008, Ministerial Meeting 18 June 2009, Brussels.

Canada, Australia: Launching of energy cooperation planned.

* Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Republic of Macedonia, Romania, Serbia & Montenegro

1.4 External energy policy: Future prospects

Building EU capacity to speak with one voice and respond effectively to external energy crisis:

- A second Strategic Energy Review was adopted by the Commission in November 2008 as a basis for an action plan for the period after 2010.
- A five-points EU Energy Security and Solidarity Action Plan was proposed:
 - Infrastructure needs and diversification of energy supplies;
 - External energy relations;
 - Oil and Gas stocks and crisis response mechanisms;
 - Energy efficiency;
 - Making the best use of EU's indigenous energy resources.

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Bilateral dialogues

- **Japan - Dialogue between DG TREN and Agency for Natural Resources and Energy (ANRE):**
 - Policy developments, geopolitical developments and impacts on global energy scene;
 - Instrumental for cooperation on the International Partnership for Energy Efficiency Cooperation.
- **China - High Level Dialogue on Transport and Energy with the National Development and Reform Commission (NDRC) and Dialogue with the Ministry of Sciences and Technology (MOST):**
 - Policy developments, energy efficiency, carbon capture and storage, research cooperation.

1.5 EU Energy relations with Asia

Bilateral dialogues (con't)

- **India - EU-India Energy Panel since 2005:**
 - **Policy developments, development of clean coal technologies, increasing energy efficiency and savings, promoting environment friendly energies as well as assisting India in energy market reforms.**

Regional dialogues

- **New EU-ASEAN Senior Officials Dialogue on Energy Cooperation**
 - **First meeting – August 2007**
 - **Initial areas of focus – biofuels, energy efficiency and investment climate**
 - **Building on previous cooperation and instruments**
 - **Unique region-to-region cooperation**

1.5 Energy under ASEM framework

- **Energy and climate change identified among the major topics for future dialogue at ASEM 6**
- **3rd ASEM Environment Ministers' Meeting, 8th ASEM Foreign Ministers' Meeting**, among others
- **1st Ministerial Conference on Energy Security** – Brussels, 18th June 2009

Topics involved included:

- **energy security, including the transparency and effective functioning of global energy markets**
- **opportunities and methods of promoting renewable energy energy efficiency and energy saving**
- **energy technology cooperation**
- **trade and investment related issues**
- **climate change and energy security**

2. Power Integration and Trade in the Rest of the World

2.1 Nordic Power Market

2.2 Central America Market

2.3 African Power Pool Organizations

- ✓ SAPP
- ✓ WAPP
- ✓ CAPP
- ✓ EAPP
- ✓ African Electricity Market (future)

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2.1 Nordic Power Market

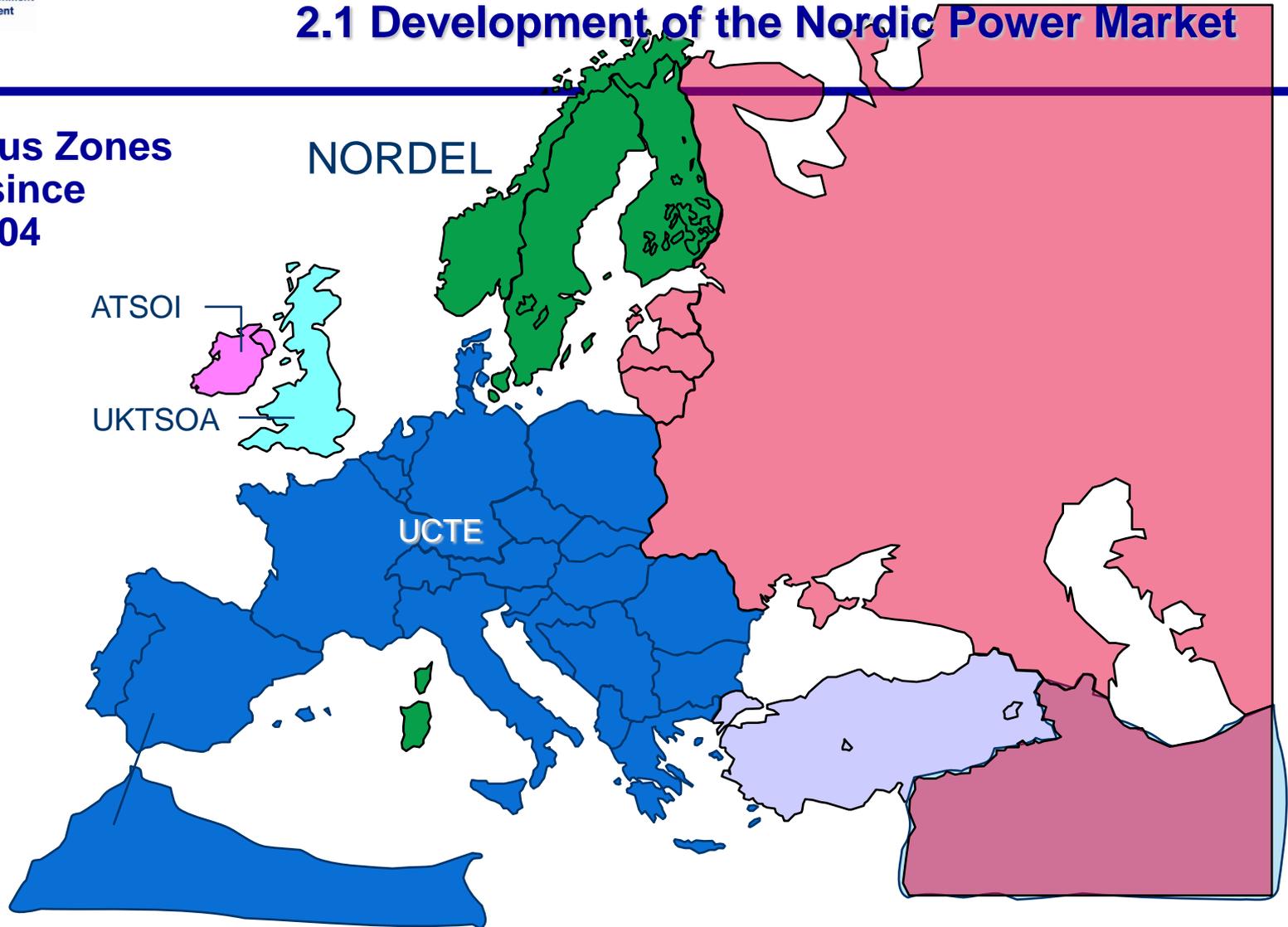
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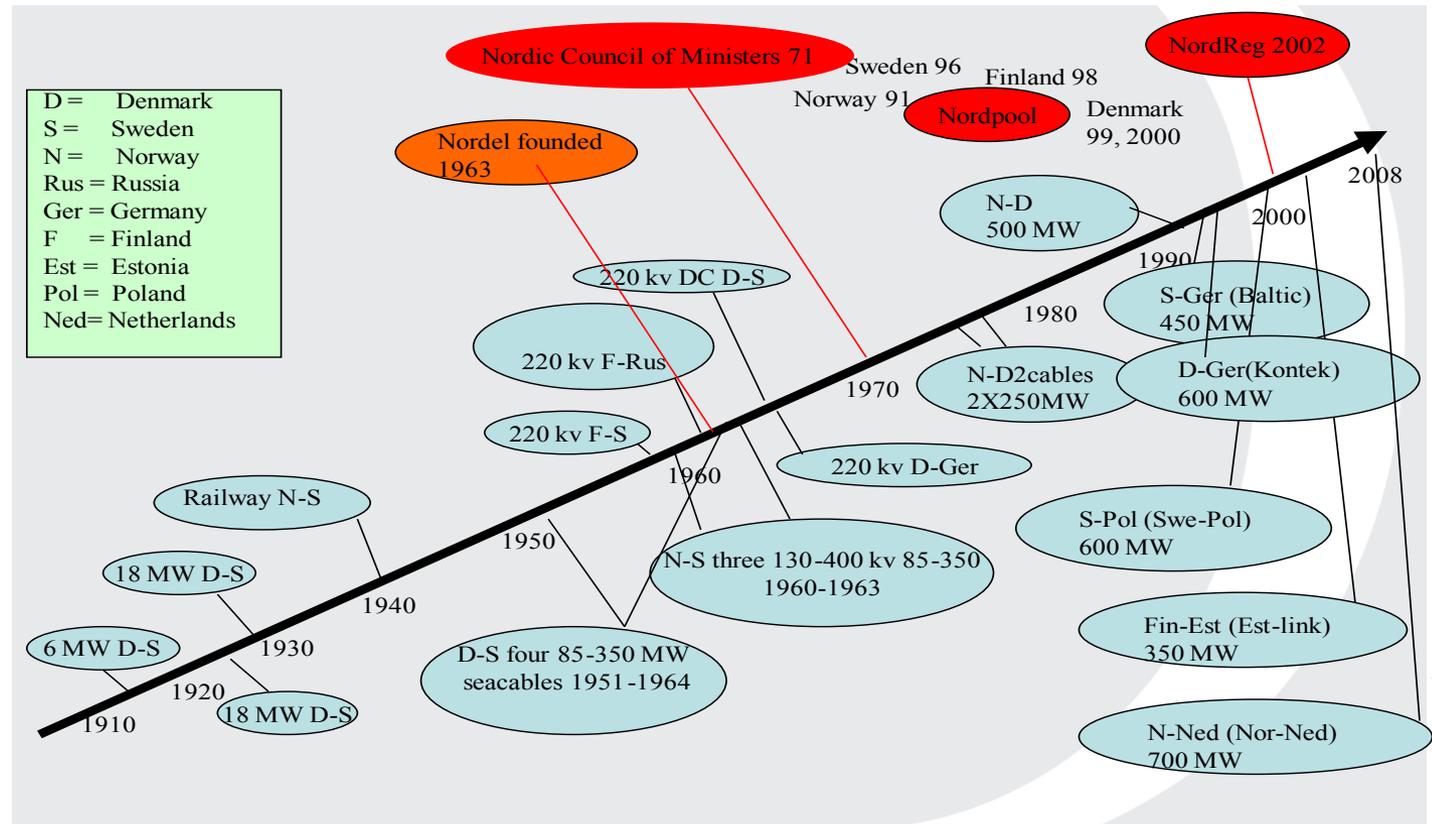
2.1 Development of the Nordic Power Market

**Synchronous Zones
in Europe since
October 2004**



2.1 Development of the Nordic Power Market

First major step towards the establishment of the Nordic power market in 1963 when Nordel (cooperative body for Nordic TSO's) was established. The mandate of Nordel was and still is to contribute to the development of a highly integrated and coordinated Nordic electricity market.

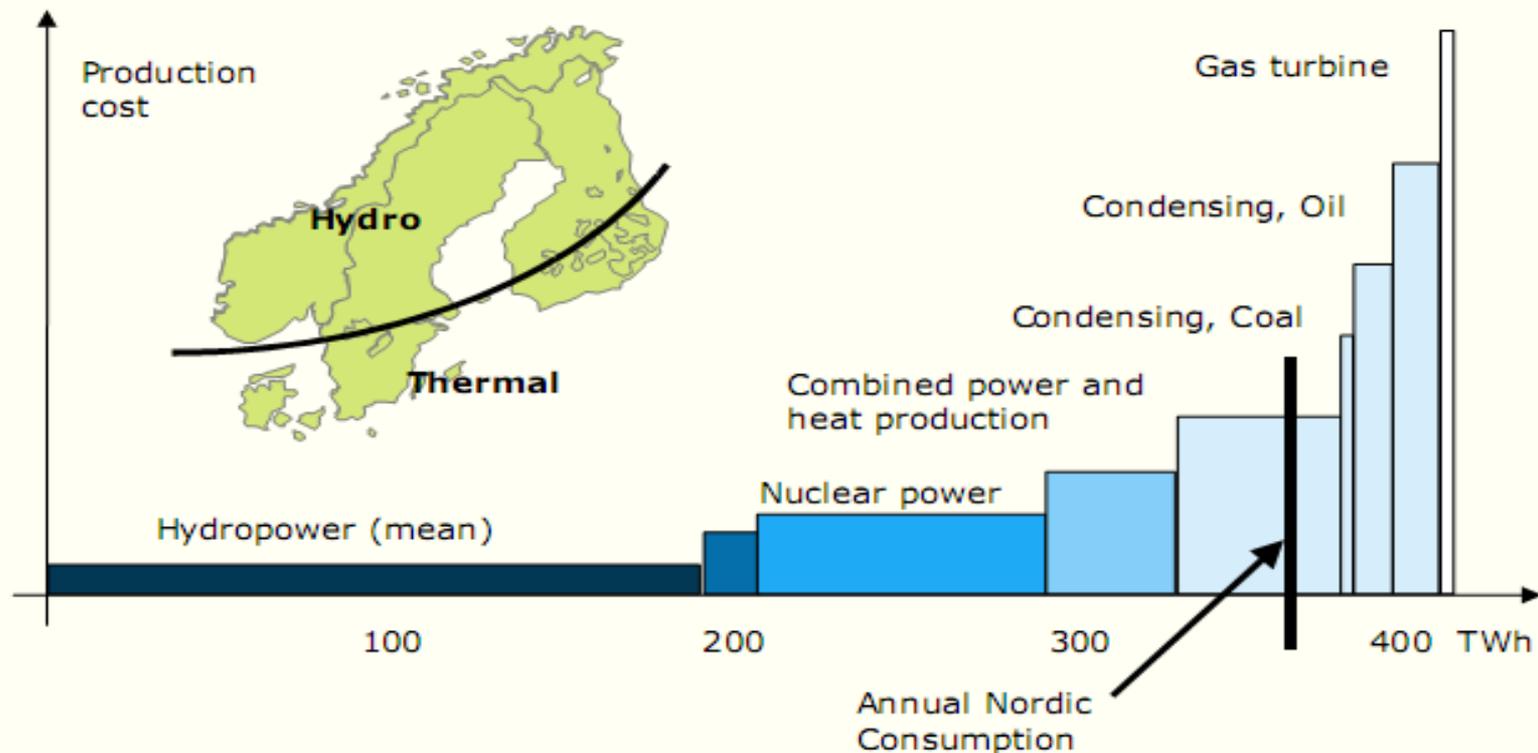


NordPool was completed when the eastern part of Denmark got integrated in the Nordic electricity market in the year 2000.

2.1 Development of the Nordic Power Market

From the start, electricity supply in the Nordic countries has been based on diverse energy sources, Hydro-power in Norway, Nuclear and Hydro power in Finland and Sweden, and Thermal power in Denmark. Due to this diversification the Nordic countries realised at an early stage that considerable benefits could be achieved through optimization of hydro and thermal energy sources via cooperation

Power production capacity in the Nordic countries



2.1 Development of the Nordic Power Market

The very first step towards a common Nordic electricity market took place already in 1915 when the first cable between Sweden and Denmark was commissioned. This cable was followed by two more cables between Denmark and Sweden within the next 15 years.



2.1 Development of the Nordic Power Market

Experience from Skagerrak I & II , Norway - Denmark Interconnection, 1976-1990:

- ✓ link between thermal (Denmark) and hydro (Norway) systems,
- ✓ based on optimisation of investment costs AND operation costs.

Benefits - Key numbers over 15 years:

- Investments: Total 125 mill. USD, split 2/3 Norway, 1/3 Denmark
 - Reduced emissions: 185,000 tons SO₂, 85,000 tons NO_x, 22,500,000 tons CO₂
 - Volumes: Net export from Norway to Denmark: 30.9 TWh
 - Improved security of supply during dry years in Norway, lower costs in wet years in Denmark.
 - The interconnection replaces investment in generation capacity in Norway and in Denmark, for energy and peak requirements, respectively.
 - Accumulated profit: Norway: 350 mill. USD, Denmark: 175 mill. USD
-

2. Power Integration and Trade in the Rest of the World

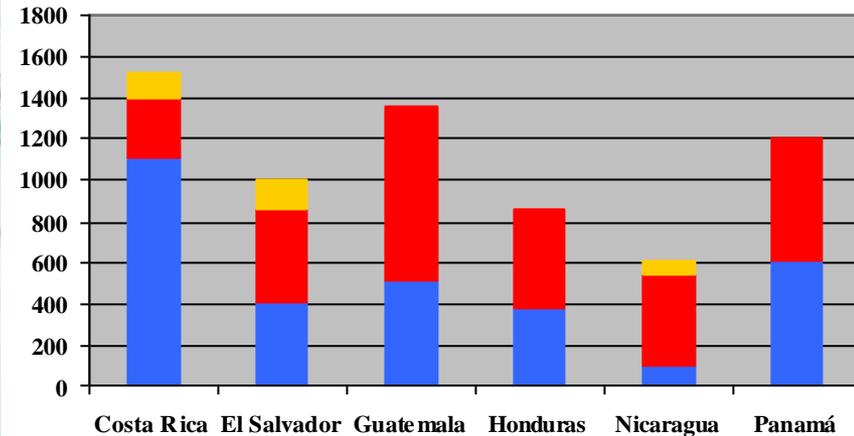
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2.2 Central America Market



■ Hydro
 ■ Thermal
 ■ Geothermal

Regional Resources

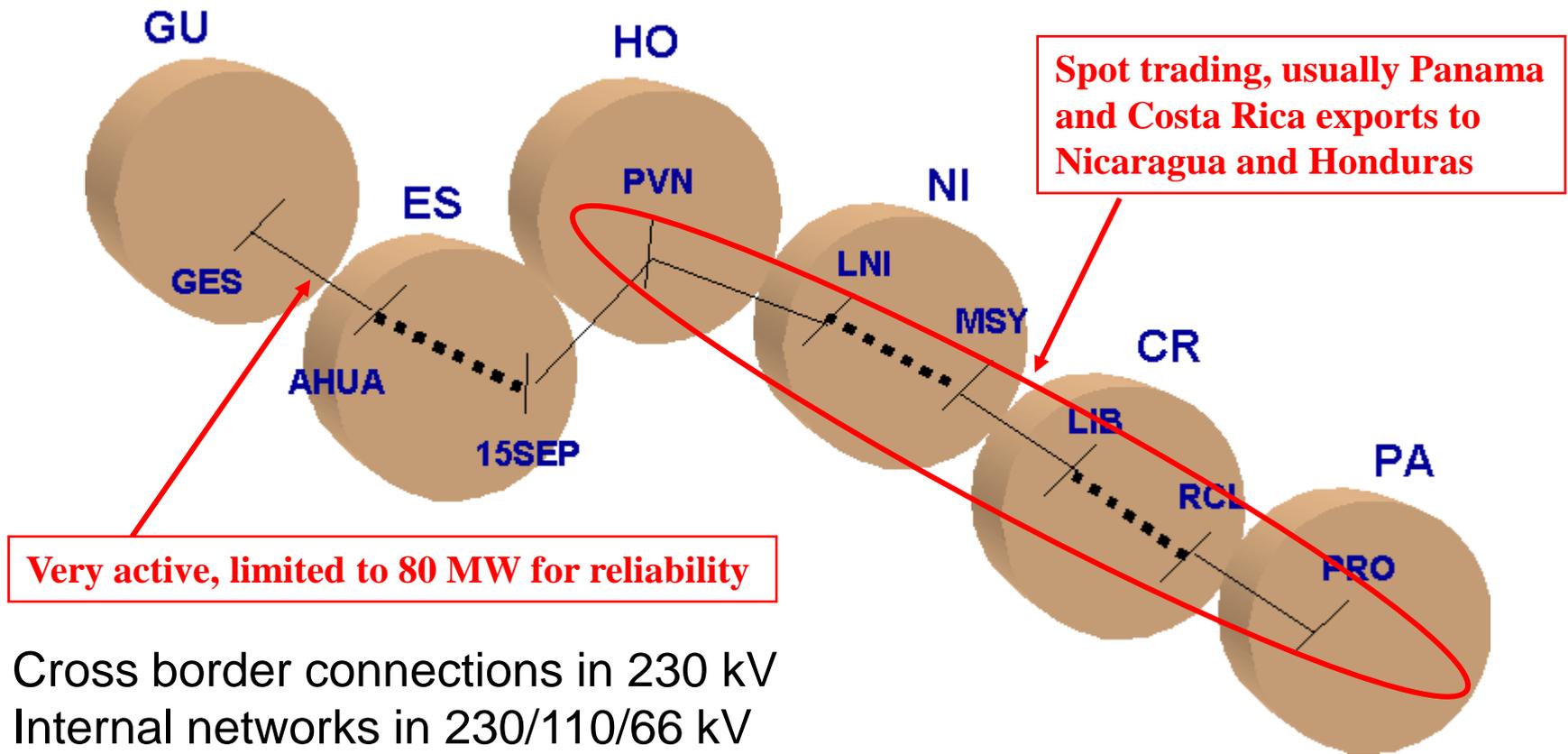
- Hydro
- Geothermal
- No oil-gas-coal reserves

Electricity Sector Organization

| Current Status | | | | | | |
|--------------------|---------|------------------|--------------|---------|---------------|--------------|
| | Reforms | Wholesale Market | Private | | | |
| | | | Distribution | Trading | Generation | Transmission |
| Costa Rica | No | No | No | No | IPP | No |
| El Salvador | Yes | Yes | All | Yes | Thermal (50%) | No |
| Guatemala | Yes | Yes | All | Yes | Thermal (60%) | No |
| Honduras | Partial | No | No | No | IPP (35%) | No |
| Nicaragua | Yes | Yes | All | Yes | Thermal (75%) | No |
| Panama | Yes | Yes | All | Yes | All | No |

The six countries participate of the regional market

Existing Connections (2003)



2.2 Central America: the Seventh Market - MER



2.2 Central America: the Seventh Market - MER

Objectives of the MER (Mercado Electrico Regional):

- **Development of regional scale generation projects (LNG, hydro, gas...)**
- **Optimization of primary resources**
- **Optimization of operation, reduction of variable costs and improvement of service quality**
 - **Hydrological diversity**
 - **Load peaks not simultaneous**
 - **Sharing of reserve**

2.2 Central America: the Seventh Market - MER

Main Issues of the Regional Market (MER)

- **The MER constitutes the seventh market, superposed with the existing markets in the six countries**
- **Market participants from the six countries are allowed to participate of the MER**
- **Regional institutions:**
 - **CRIE (Regulatory body)**
 - **EOR (System Operator & Market Administrator)**
- **Countries can preserve local regulations, with the changes necessary for compatibility with regional codes**
- **Regional firm contracts, the basis for trading and expansion**
- **Spot market for short term optimization and balancing**

2.2 Central America: the Seventh Market - MER

Main Issues of the Regional Market (*con't*)

- **Regional grid (RTR: Red de Transmission Regional): SIEPAC + existing connections between countries + national lines allocated to regional operation + regional expansions**
- **Expansion of the regional grid: planned and market based**
- **Nodal prices**
- **Auctions for allocation of scarce transmission capacity (as transmission rights)**
- **Market:**
 - **Bilateral contracts (firm contracts have dispatch priority)**
 - **Spot**
 - ✓ Day Ahead
 - ✓ Real time balance
- **Ancillary services**

2. Power Integration and Trade in the Rest of the World

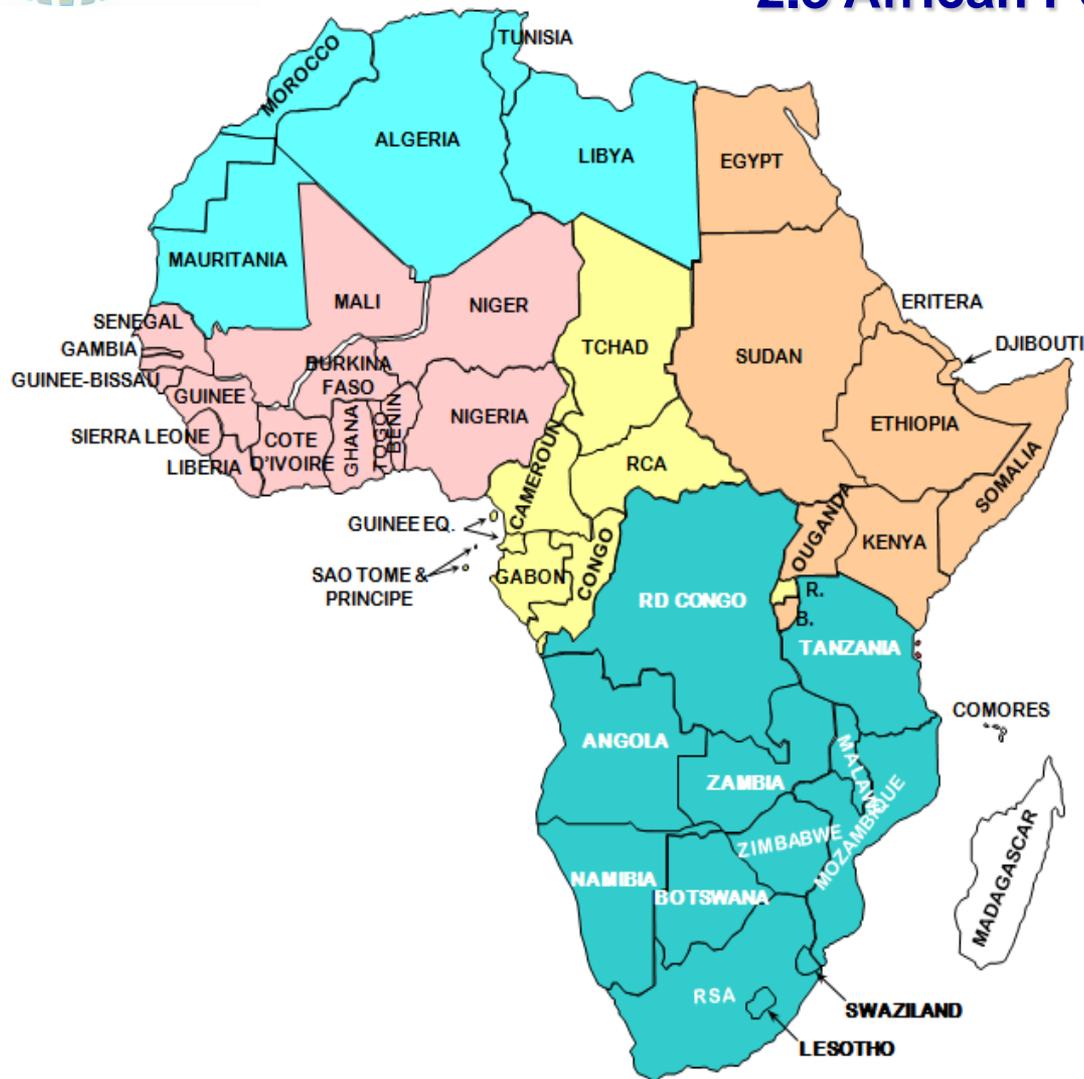
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2.3 African Power Pool Organizations

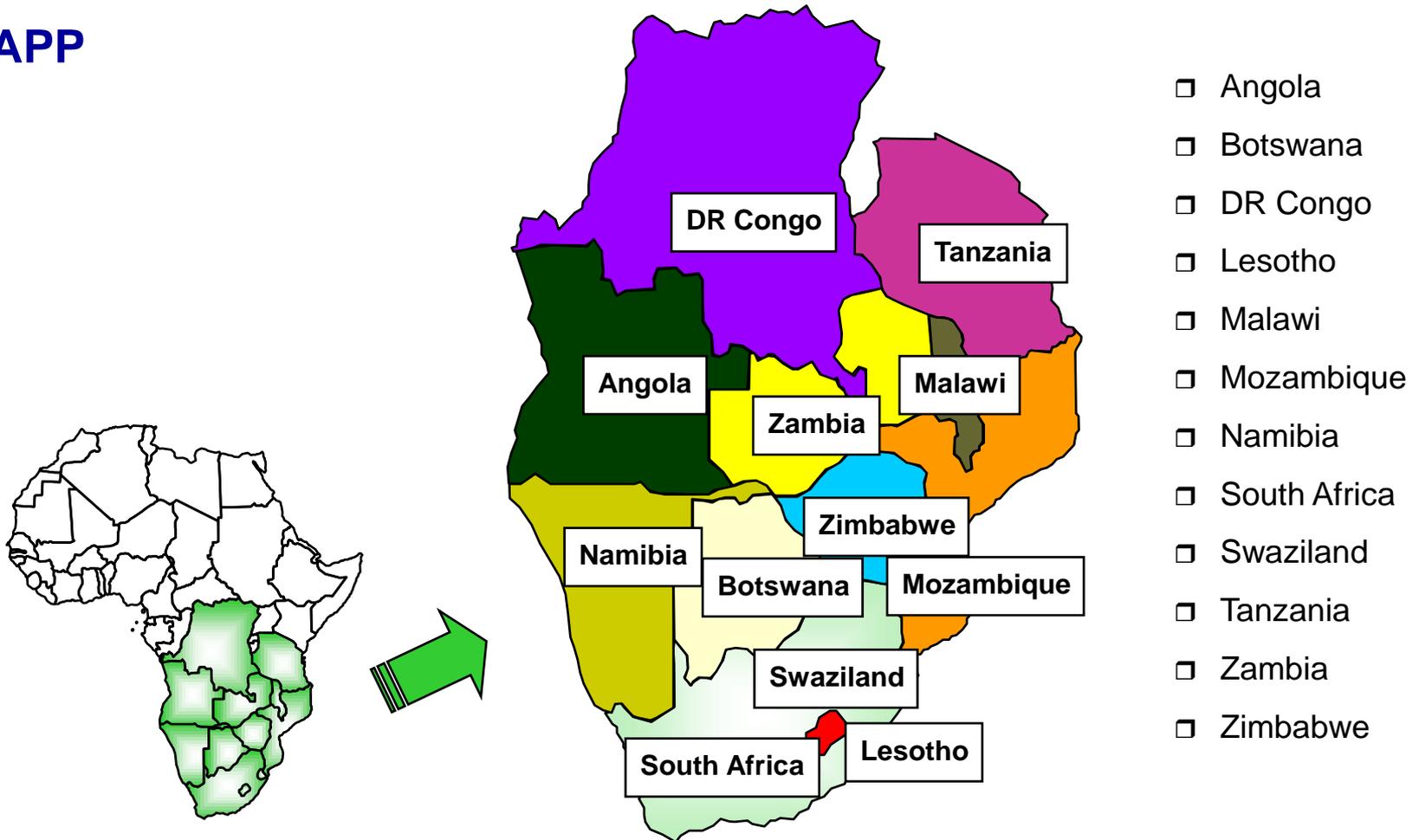


POWER POOLS IN AFRICA



2.3.1 The Southern African Power Pool (created in 1995)

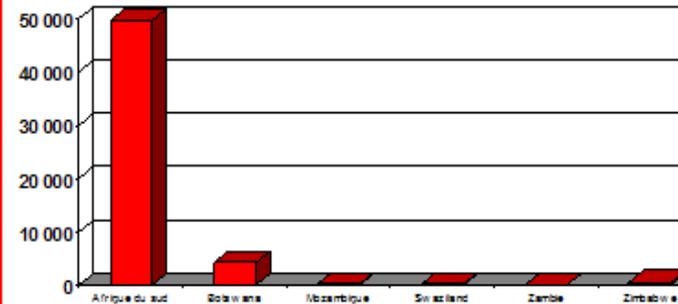
SAPP





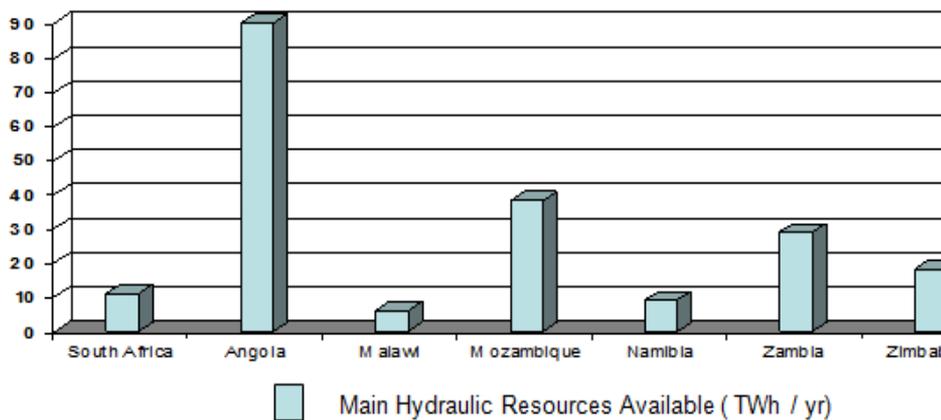
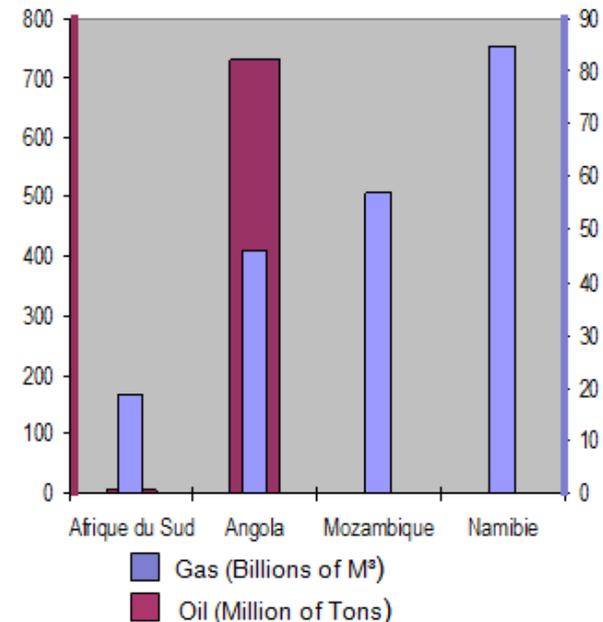
Energy Potential

-  Exploiting Capacities ~ 204 TWh/yr
-  ~ 207 Billions of M³
-  ~ 733 Millions of Tons
-  Nuclear Station → 11,3TWh /an

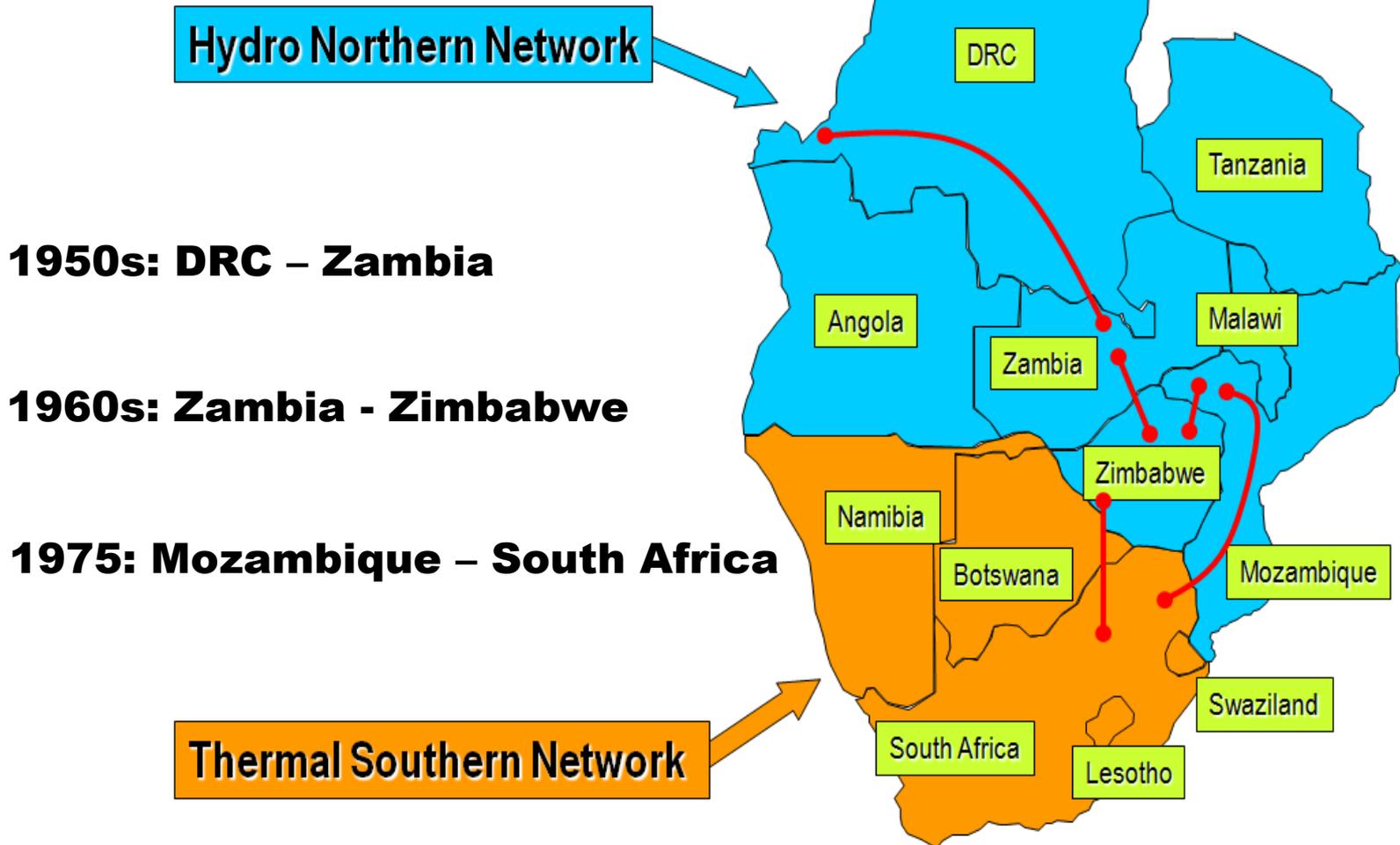


■ Coal (Million of Tons)

- ✓ Recoverable Coal Reserves= 49,250 Million of Tons
- ✓ Development of the Electricity Production based on Coal (South Africa)

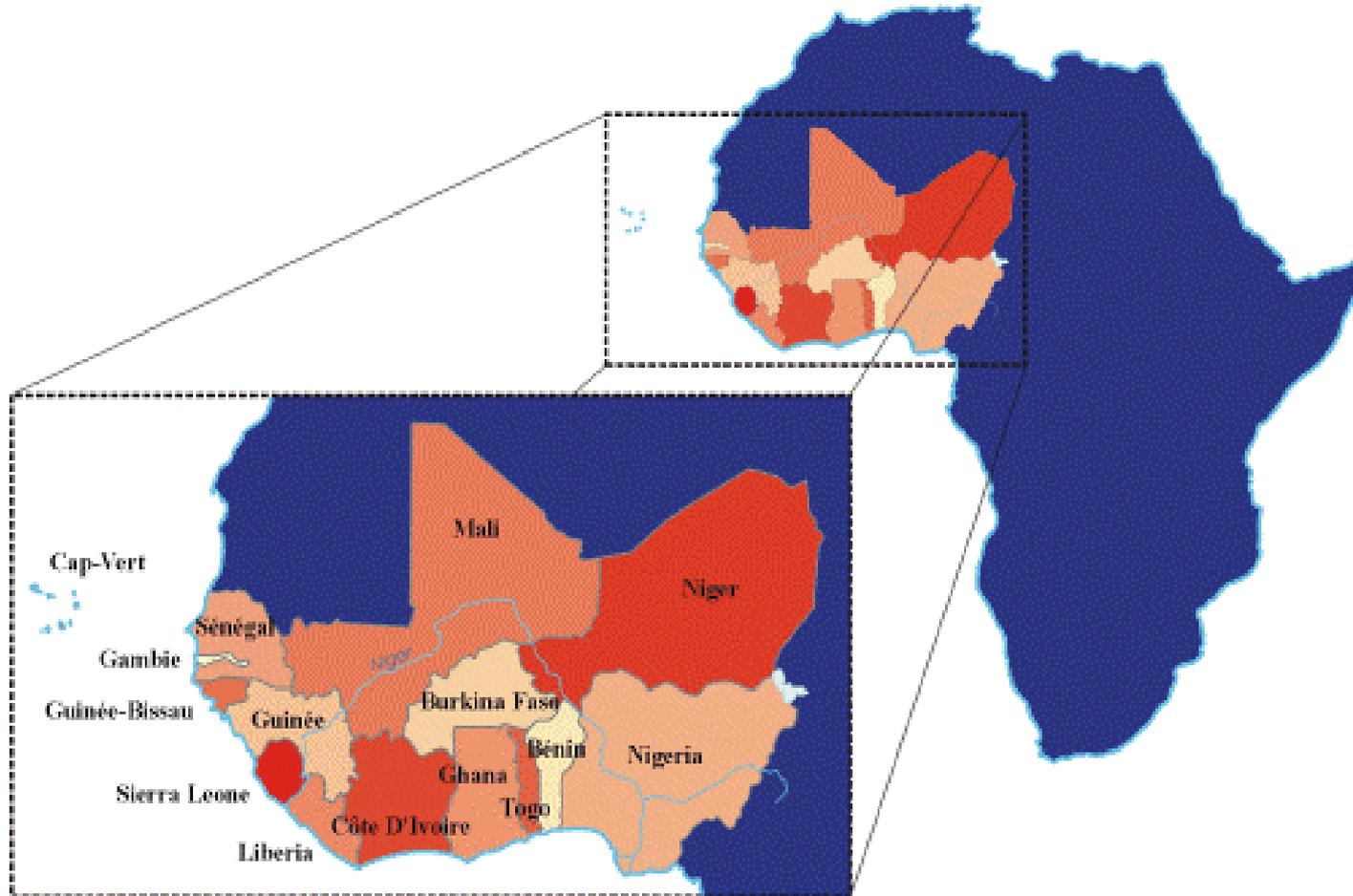


2.3.1 SAPP – Infrastructure Development



2.3.2 The West African Power Pool (created in 2000)

WAPP





Energy Potential



Gas: 3.600 Billions of M3

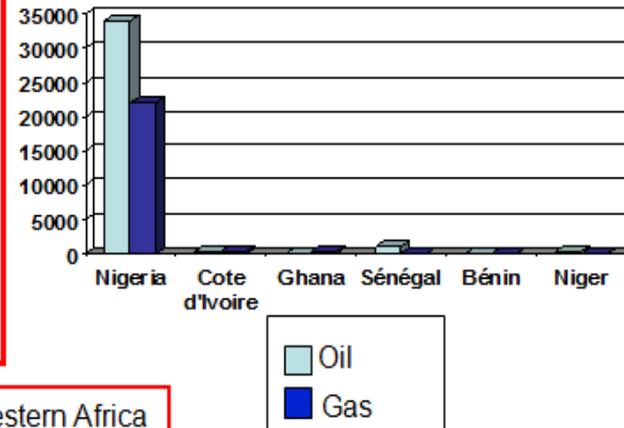


Oil: 3.017 Millions of Tons
(crude oil and LNG)

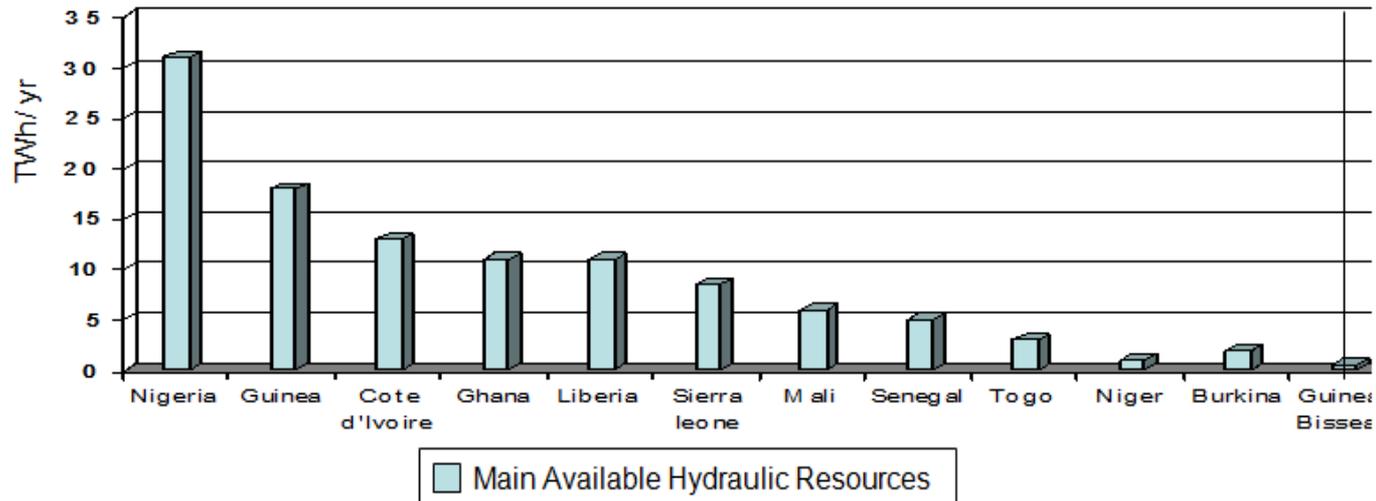


Hydroelectricity: 23.900 MW

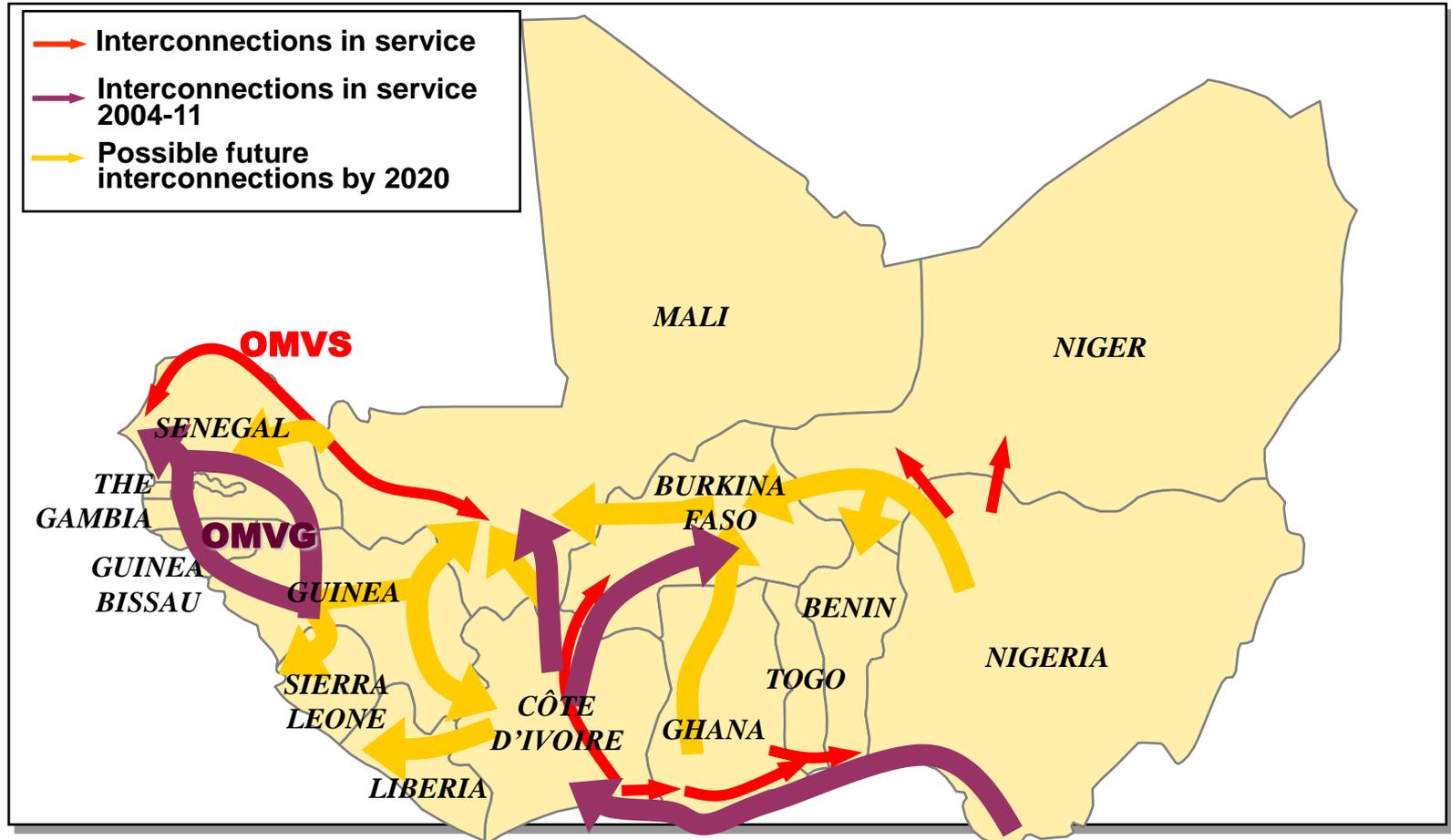
Reserves of Oil and Gas
(Million Barrel of Oil Equivalent)



- ➔ 31 % of Gas Proved Reserves in Africa are located in Western Africa
- ➔ 30 % of Oil Proved Reserves in Africa are located in Western Africa

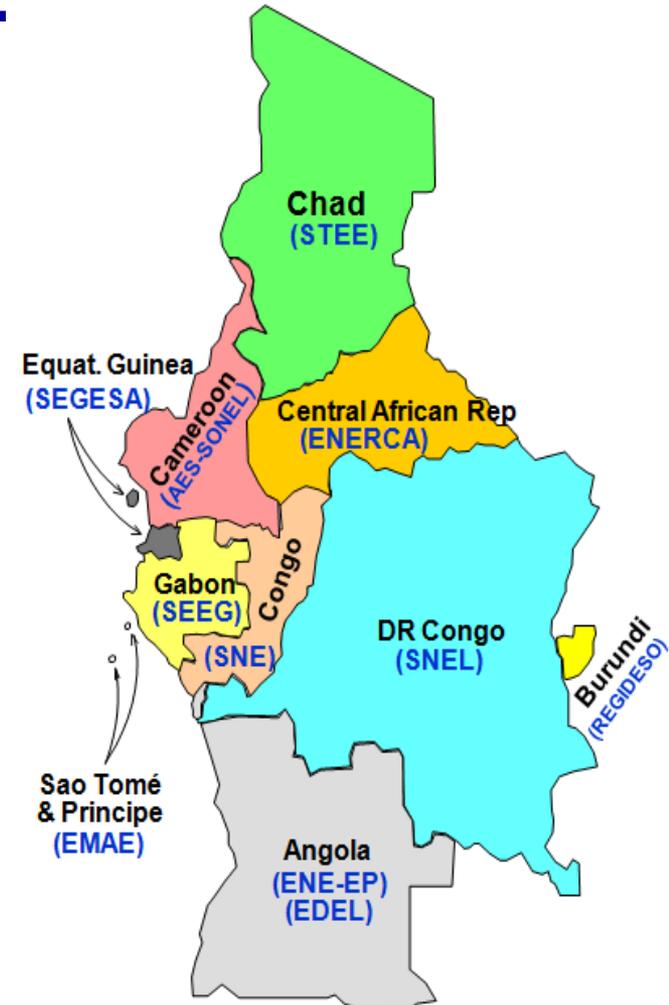
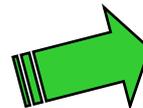


2.3.2 WAPP – Infrastructure Development

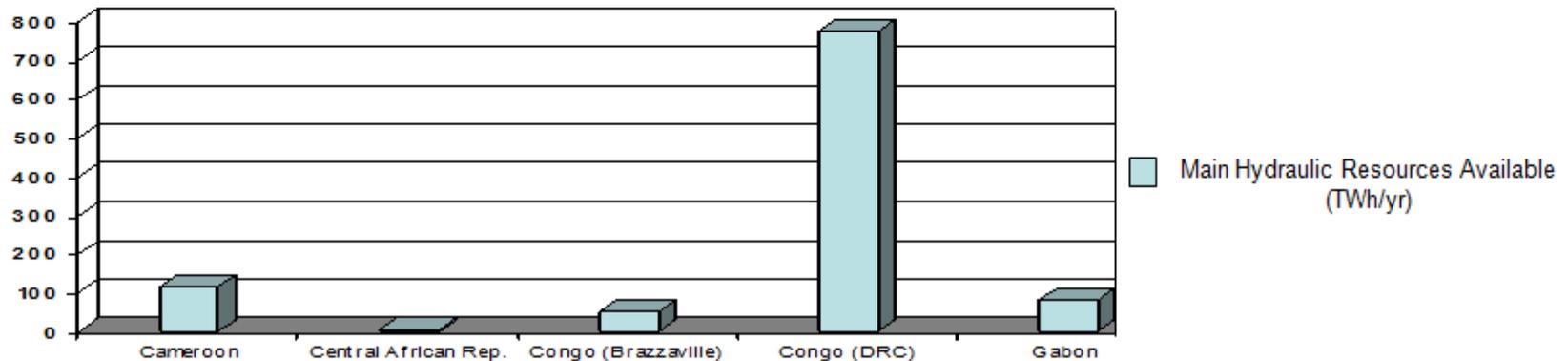
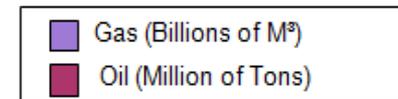
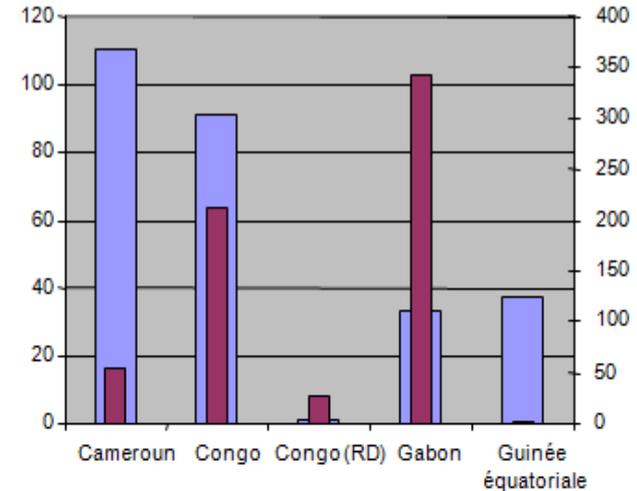
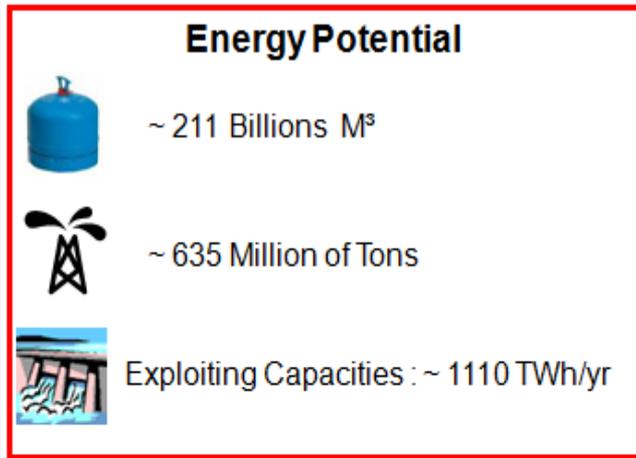


2.3.3 The Central African Power Pool (created in 2003)

CAPP



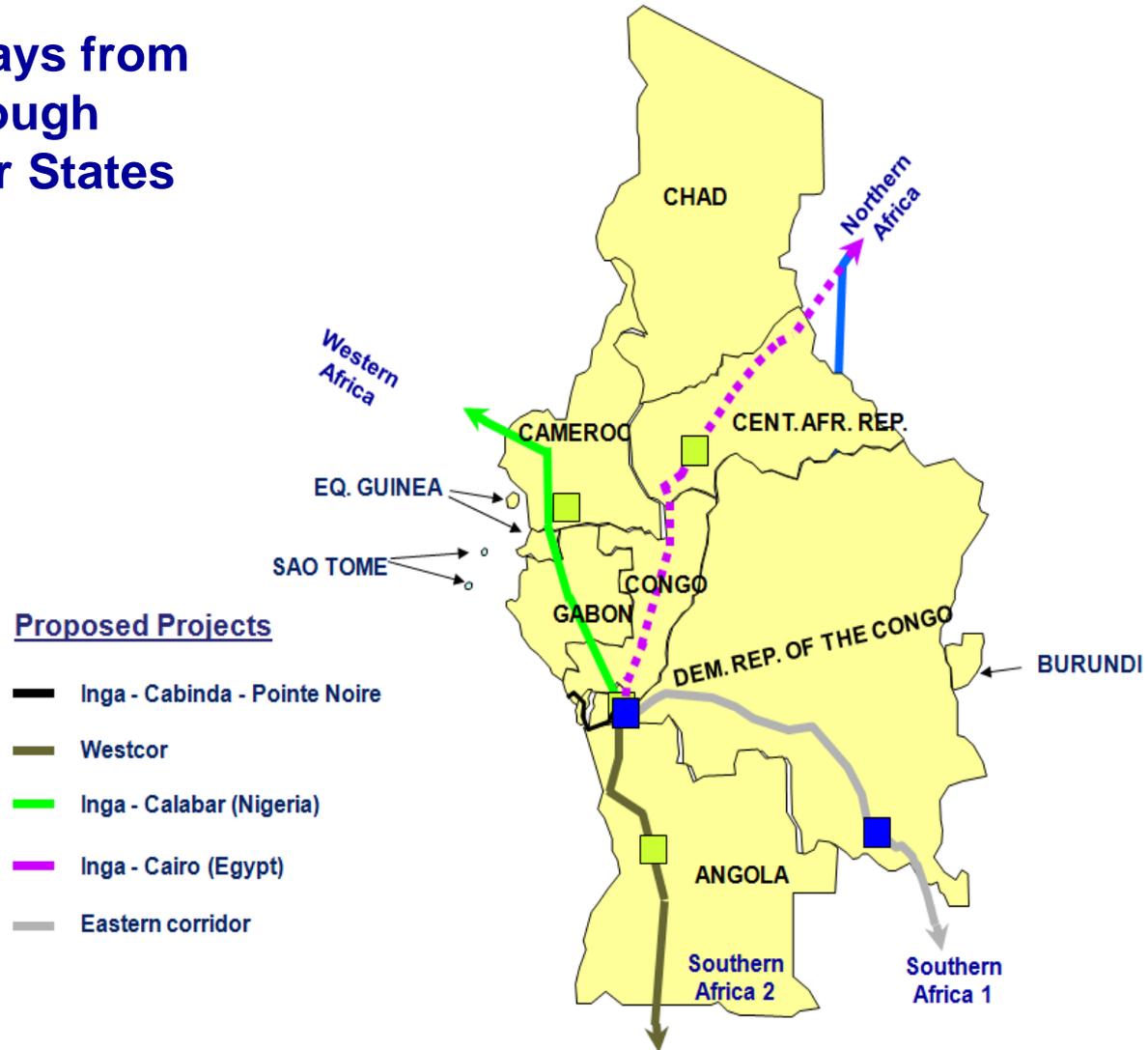
2.3.3 CAPP



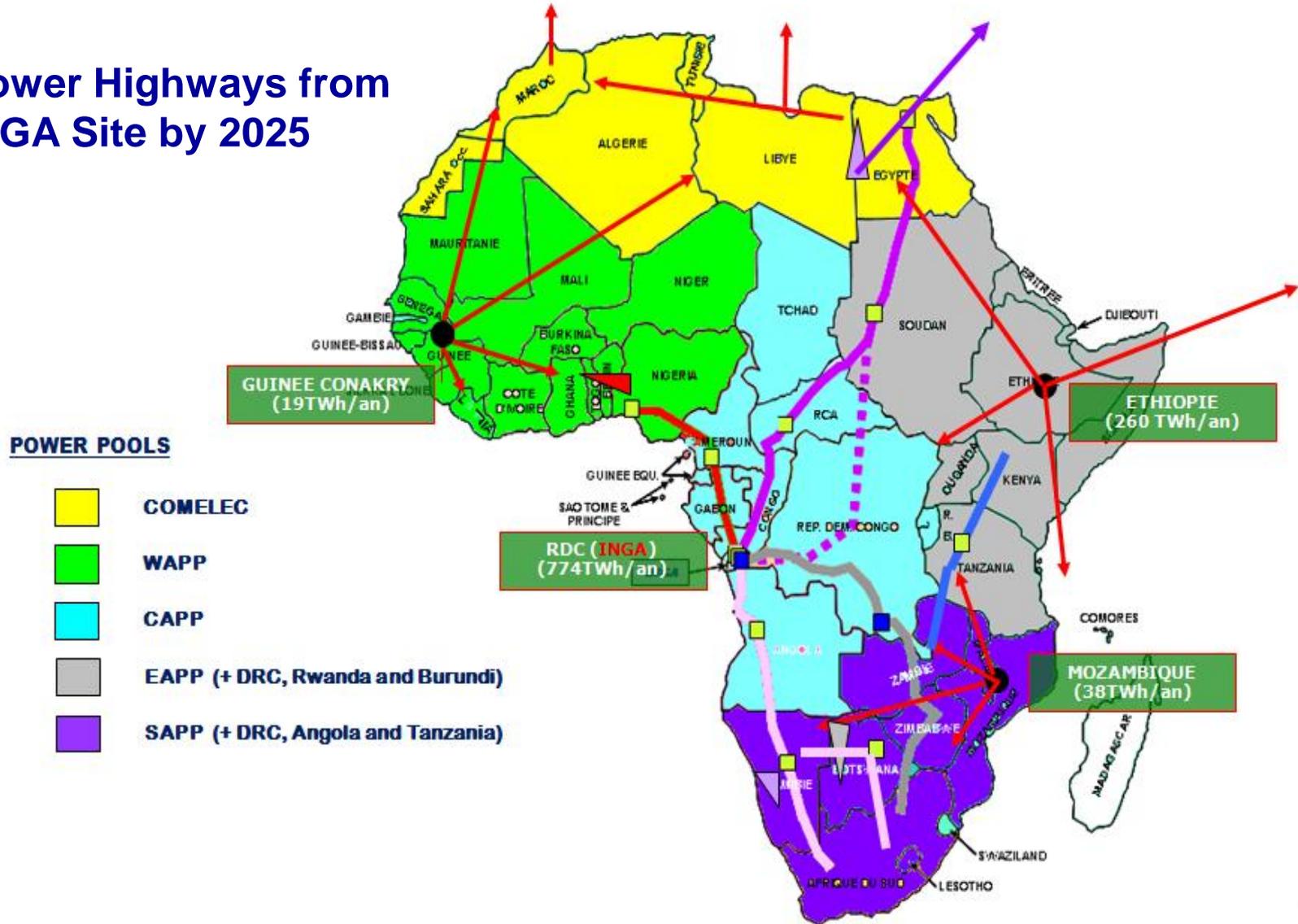
The Sub-Region Rate of Electrification : 13.4%

Hydroelectricity represents 90% of the Sub-Region Electric Production

Power Highways from INGA Site through CAPP Member States

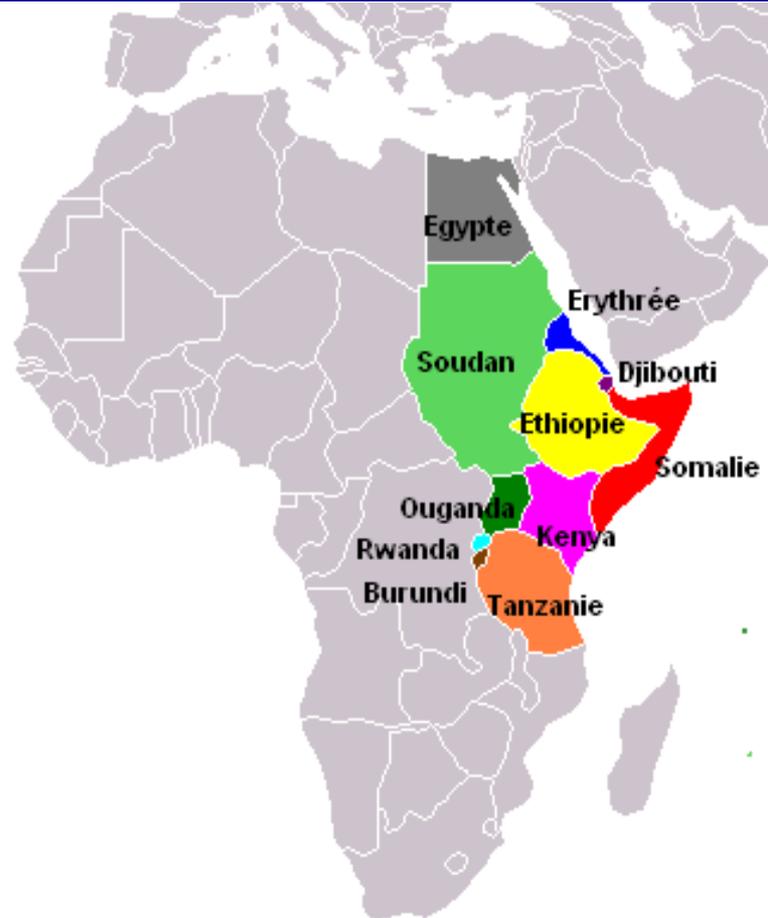


Power Highways from INGA Site by 2025

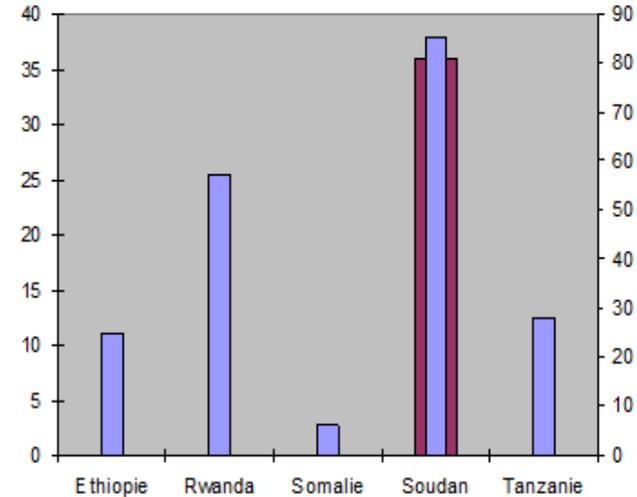
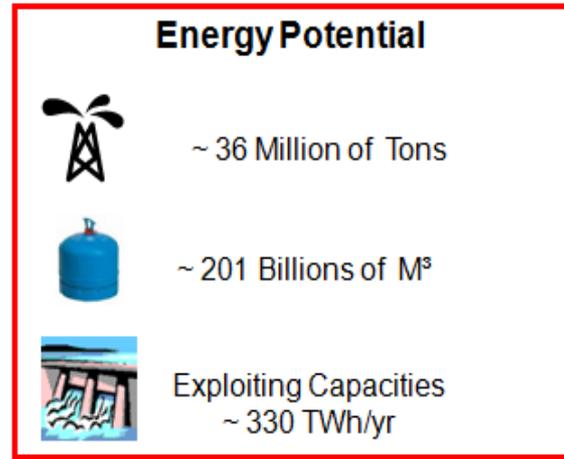


2.3.4 The Eastern African Power Pool (created in 2005)

EAPP

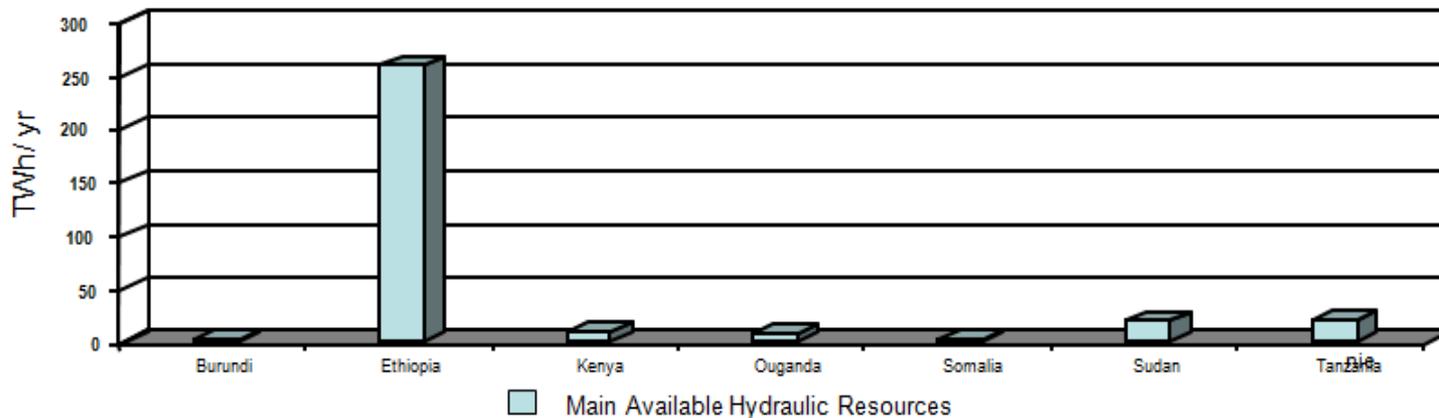


2.3.4 EAPP



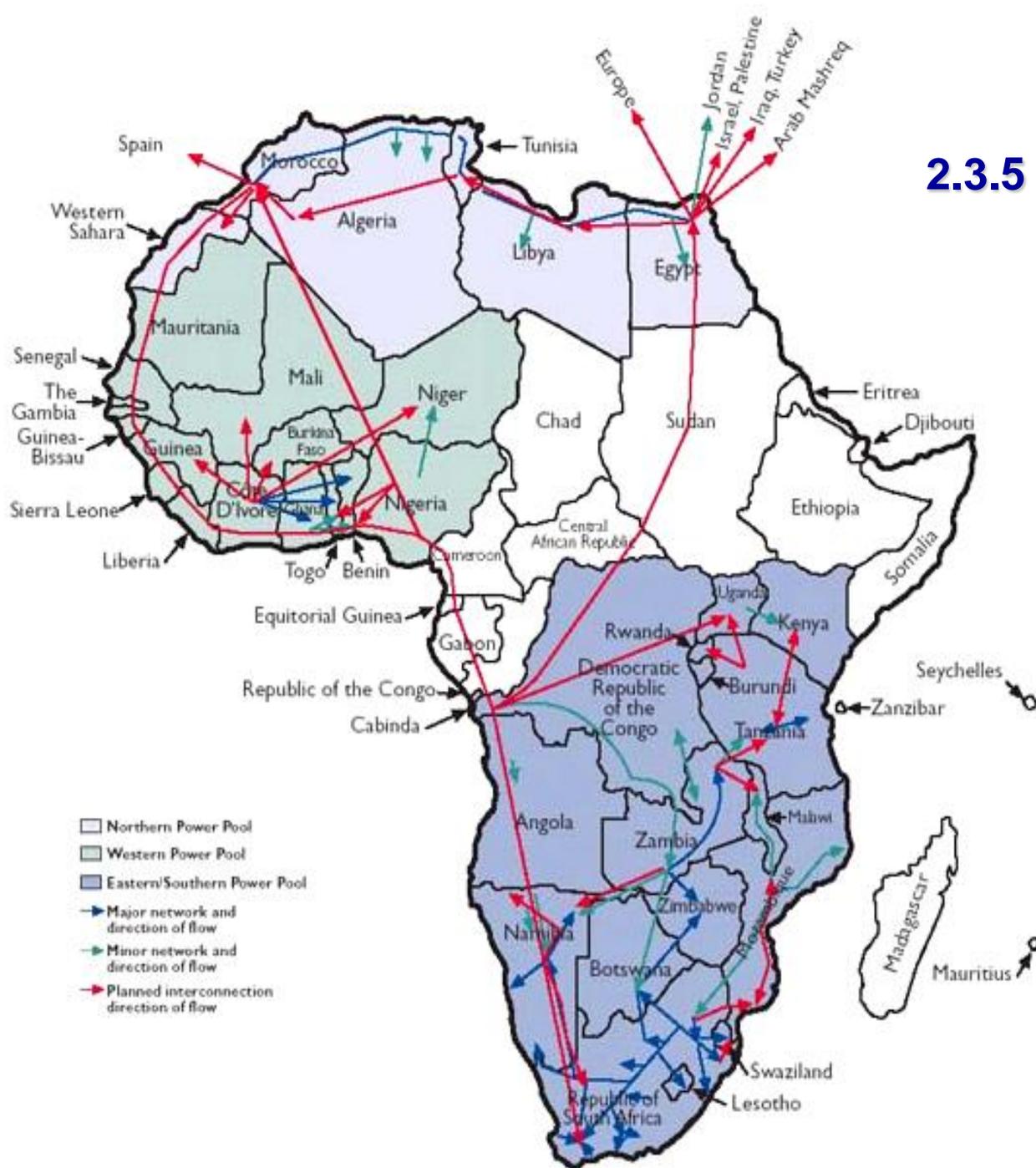
- ✓ Primary Energy Resources Available for Electricity Generation = 550 TWh/y (with Egypt)
- ✓ Gas + Hydroelectricity = 40% of the Potential

■ Gas (Billions of M³)
■ Oil (Millions of Tons)



Energy Trading

2.3.5 The future African Electricity Market



3. Power Trade in the GMS (ADB GMS RETA 6440)

3.1 ADB GMS RETA 6440 Project General Presentation

3.2 Important Issues for the GMS Electricity Market

3. Power Trade in the GMS (ADB GMS RETA 6440)

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3.1 ADB GMS RETA 6440 Project General Presentation



ADB/GMS RETA 6440

Facilitating Regional Power Trading and Environmentally Sustainable
Development of Electricity Infrastructure in the Greater Mekong Subregion

“RETA No 6440 General Presentation and Status of Implementation”

Prepared by : Michel CAUBET, Project Team Leader, COMPONENT 1
 Thierry LEFEVRE, Deputy Team Leader, COMPONENT 2



3.1 ADB GMS RETA 6440 General Presentation

Project Organisation

- **A strong Association of well-known International Consulting Firms was created under the Leadership of RTE International with:**
 - EDF-CIH, Hydro Engineering Centre – FRANCE;
 - Nord Pool Consulting AS (NPC) – NORWAY;
 - Power Planning Associates (PPA) – UK;
 - Franklin Paris, Legal Firm – FRANCE;
 - Centre for Energy Environment Resources Development (CEERD) – THAILAND;
- **Partnership was established with National Consulting Firms and Independent Consultants in five GMS Countries.**
- **Two Components:**
 - Component 1: Facilitating Regional Power Trading, taken in charge by the Project Team Leader (RTE International)
 - Component 2: Environmentally Sustainable Development of Infrastructures, taken in charge by the Deputy Team Leader (CEERD)

3.1 ADB GMS RETA 6440 General Presentation

COMPONENT 1 is composed of 5 Modules:

- Module 1: Regional Power Interconnection Master Plan (EDF-CIH)
- Module 2: Methodology for Assessment of Benefits (NPC)
- Module 3: Power Transmission Studies (RTE & PPA)
- Module 4: GMS Regulatory Framework (RTE, NPC, PPA, Franklin)
- Module 5: Update of the Structure of the Existing Regional Database (RTE)

COMPONENT 2 is composed of:

- Strategic Environmental Assessment (SEA) – (CEERD)
- Environmental Impact Assessment (EIA) – (CEERD)

A Project Office was set up in Bangkok, under the management of CEERD

A Web Site for the Project www.gms-powertrade.net

was launched on January 2009, to help team members sharing reports and documents with user friendly upload/download tools, and later on to inform the General public on the developments & outputs of the Project.



GMS Regional Trading and Environmentally Sustainable Development of Electricity Infrastructures



- About the Project
- Project Partners
- Agenda of Activities
- Trainings
- Contact

Welcome to Asian Development Bank's Regional Technical Assistance (RETA) 6440 REG website: "Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion"

Background

This program has been largely supported by the Asian Development Bank (ADB), which plays a central role of coordinating and mediating. It co-chairs as such the RPTCC.

Project Objectives

Within the context briefly described above, the general objectives of the Project are:

More about the project at ADB

(<http://www.adb.org/Projects/project.asp?id=41018>)

Disclaimer: This website has been produced with the financial assistance of the ADB. The views expressed herein are those of the project and do not necessarily reflect the official opinion of SIDA or the ADB.

WWW.GMS-POWERTRADE.NET

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Christian Viladrich,
Welcome

PHOTO

Discussion Forum
Recent messages

Glossary
terms

Library of materials for participants
COMPONENT 1 POWER SYSTEM (0 inserted documents)
COMPONENT 2 ENVIRONMENT (0 inserted documents)

Library of project related documents
Directories (2 inserted documents)
Project Reports / Minutes of Meetings (3 inserted documents)
Project Templates (3 inserted documents)

Library of shared documents
Shared Documents Box (1 inserted documents)

Library of technical documents
COMPONENT 1 MODULE 1 - Regional Power Interconnection Master Plan (84 inserted documents)
COMPONENT 1 MODULE 2 - Methodology for Benefit Sharing (10 inserted documents)

PROJECT MANAGEMENT
All Project Managers
G. de Montravel (RTE Project Director)
M. Caubet (Team Leader - Power System Planner)
T. Lefevre (Deputy Team Leader - Environmental Planner)

COMPONENT 1
All COMPONENT 1 Experts
International Experts only
National Experts only

MODULE 1
All MODULE 1 Experts
International Experts only
National Experts only

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Energy Trading

3.1 Website Structure

< Public website at www.gms-powertrade.net

Restricted area: v access to expert's accounts

3.1 ADB GMS RETA 6440 Website Structure

- **A public part, accessible to all Internet users:**
 - ✓ Project presentation / Partners description
 - ✓ Agenda of activities
 - ✓ Training page (password accessed) for training materials available online
 - ✓ Contact page
- **A restricted area for the project team:**
 - ✓ Team members Directory (list of National & International Experts sorted by Component / Module, with email shortcuts)
 - ✓ Searchable Library of Project Documents (templates, reports, presentations, data files, technical documents, etc.) managed by the team members themselves

| COMPONENT 1 MODULE 1 - Regional Power Interconnection Master Plan | | | | | | | | | | UPLOAD |
|---|--|---------------|--------------------|----------------|-------------|---------------|---|-----|------|---|
| | Title | Category | Authors | Published Date | Inserted By | Inserted Date | | | Mb |  |
|  | CDRom Laco Component 1 | | LACO | 18/03/09 | adminbkk | 19/03/09 |  | zip | 4.16 |  |
|  | GMS Master Plan 2008 - Power point presentation - HCMC Nov2008 | Presentations | Soluziona Mercados | 01/11/2008 | cviladrich | 03/02/09 |  | ppt | 0.57 |  |
|  | GMS Master Plan 2008 - Power point presentation - | Presentations | Soluziona Mercados | 01/06/2008 | cviladrich | 03/02/09 |  | pdf | 0.60 |  |

3. Power Trade in the GMS (ADB GMS RETA 6440)

3.1 ADB GMS RETA 6440 Project General Presentation

3.2 Important Issues for the GMS Electricity Market

3.2.1 GMS Power Interconnection Projects



3.2.2 Towards Unbundling within the GMS

- **Present situation (depending on the countries)**
 - ✓ **Merchant lines owned by investors with long term export contracts**
 - ✓ **EHV lines owned by generators**
 - ✓ **EHV lines owned by the integrated national electricity utilities**

- **The following steps have to be implemented (Phase 1a)**
 - ✓ **Creation of a permanent organization of all the stakeholders of the GMS power industry**
 - ✓ **Creation in each country of a mix ISO/TSO (new structure)**
 - Assessment in each country of the value of the transmission assets
 - Transfer of ownership (where possible) of the transmission lines into the new structure
 - Definition by the regulator of mandatory profitability ratios (financial and economic) for this new structure
 - Definition by regulatory authorities of a standard network access tariff allowing the above mentioned mandatory profitability ratios

3.2.3 Towards an Electricity Market within the GMS (1)

- **Present situation (depending on the countries)**
 - ✓ **Regulated electricity prices to end customers** (These regulated prices may not always cover investment and operation costs or even operation costs, i.e. they are subsidized)
 - ✓ **Shortage of generation, thus necessity to attract private investors**
 - ✓ **No competition at generation level / No eligibility at consumption level**
- **The following steps have to be implemented (Phase 1b)**
 - ✓ **Drafting of a market code**
 - ✓ **Neutral splitting of existing long term PPA contracts**
 - The long term PPA contracts shall be split into transmission and generation in order to guarantee to the investors no change in their profitability ratio
 - ✓ **Neutral Transformation of existing long term PPA contracts**
 - The long term PPA contracts shall be changed into financial CFD contracts giving the investors the same financial conditions as per the former PPAs.
 - ✓ **Progressive increase in the regulated electricity prices**
 - The target regulated electricity prices shall be calculated to cover the investment and operation costs of the generation, the transmission and the distribution; they shall be based on a standard regulated profitability ratio

3.2.3 Towards an Electricity Market within the GMS (2)

- **The following steps have to be implemented (Phase 2):**
 - ✓ **Creation in each country of a trading platform operated by the single buyer**
 - The producers shall have the obligation to bid on a day ahead base , and sell the power foreseen in the former PPAs to the single buyer at capped prices (the prices are free but capped). The surplus may be bid at free prices (without cap)
 - The fixing shall take place daily at the end of the morning.
 - ✓ **Creation in each country of a balancing mechanism operated by the TSO/ISO (single buyer), thus a market based system to balance on a real time base generation and consumption, and to manage bottlenecks by redispatching**
 - The producers shall have the obligation to put their whole unused capacity at the disposal of the single buyer for balancing purposes. The prices on the balancing market shall not be capped, i.e. it will be a pay as bid system.

3.2.3 Towards an Electricity Market within the GMS (3)

- **The following steps have to be implemented (Phase 3)**
 - ✓ **Harmonization of market rules in the GMS**
 - The market codes shall be harmonized
 - ✓ **Coupling of the trading platforms within the GMS**
 - The interconnections shall be fully used and the profits shall be used by the TSOs/ISOs (market operators) to build or reinforce the interconnections
 - ✓ **Progressive liberalization of the prices by lifting up the caps set by the single buyers on the generators' bids**

 - **The following steps have to be implemented (Phase 4)**
 - ✓ **Progressive liberalization of the end-user Electricity market**
 - The market codes shall be harmonized
 - ✓ **Full mature stage of the GMS electricity market**
-

3.2.4 Keywords for the GMS Regional Electricity Market

- **Transparency:**
 - ✓ Regulated third party access to the grid (publication of access rules and tariffs - no merchant lines)
 - ✓ Real independence of TSOs
 - ✓ Independent regulatory authority
- **Harmonisation:**
 - ✓ Harmonisation of access rules and tariffs
 - ✓ Harmonisation of regulators' prerogatives
 - ✓ Harmonisation of market rules

THANK YOU FOR YOUR ATTENTION