POLICY DIALOGUE ON

RENEWABLE GENERATION AND REGIONAL POWER TRADE IN AFRICA

February 20, 21 and 22, Madrid, Spain

DAY 2

POLICY DIALOGUE ON

RENEWABLE GENERATION AND REGIONAL POWER TRADE IN AFRICA

DAY 2 – FEBRUARY 21

9:30 to 11:00. Session 3. Deployment of network infrastructure with a regional perspective

- Transmission planning: Allocation of responsibilities in setting the criteria, decision making, enforcement and implementation.
- A regional approach to transmission cost allocation.

11:00 to 11:30. Coffee break.

11:30 to 13:00. Session 4. Market rules for efficient operation. Dealing with security of supply concerns.

- Issues with physical bilateral contracts. Addressing economic efficiency and security of supply.
- Approaches to regional market organisation

13:00 to 14:30. Lunch.

14:30 to 16:00. Optional session on "Grids and Infrastructure: The backbone of renewable energy systems" within the SPIREC main program.

16:00 to 16:30. Coffee break.

AFRICAN SCHOOL OF REGULATION

ASR Policy Dialogue Series

RENEWABLE GENERATION AND REGIONAL POWER TRADE IN AFRICA

Session 3: Transmission planning & cost allocation in regional markets

February 20, 21 and 22. Madrid, Spain

Topics for session 3

- How to **facilitate investment** in transmission from a **regional perspective**?
  - Clear **responsibility** in network planning & in **enforcing** the plans
  - Sound remuneration regulation can achieve **low investment risk**
- How is a sound approach to **transmission cost allocation** that
  - **does not discourage trade** unnecessarily?
  - **does not create opposition** to beneficial transmission projects unnecessarily?

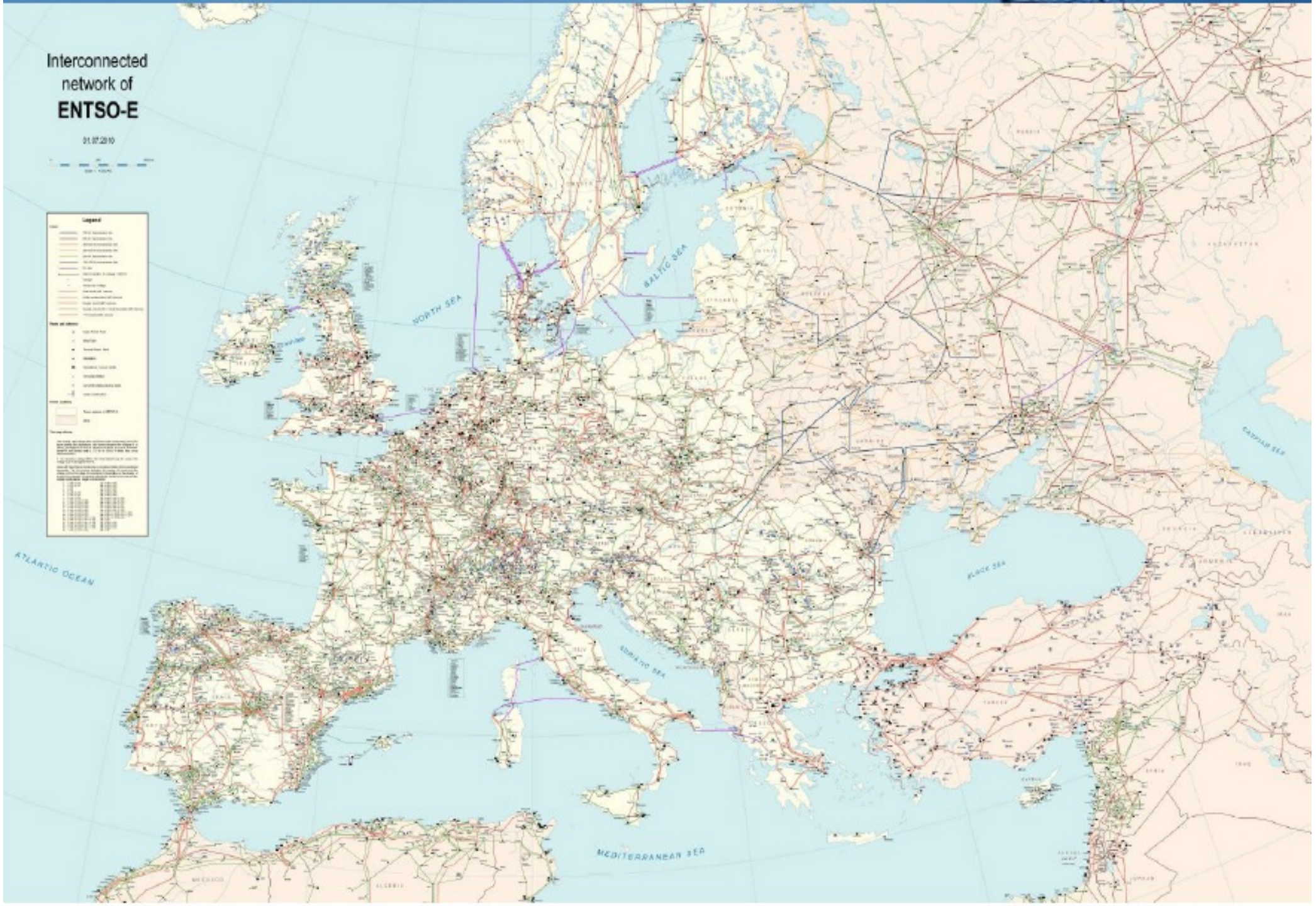
Regulation for regional trade must be guided by the "Single system paradigm"

The "Single system paradigm"

Design regional regulation so that the expected outcome is as close as possible to that of a sound regulation for *a single system of regional dimension*.

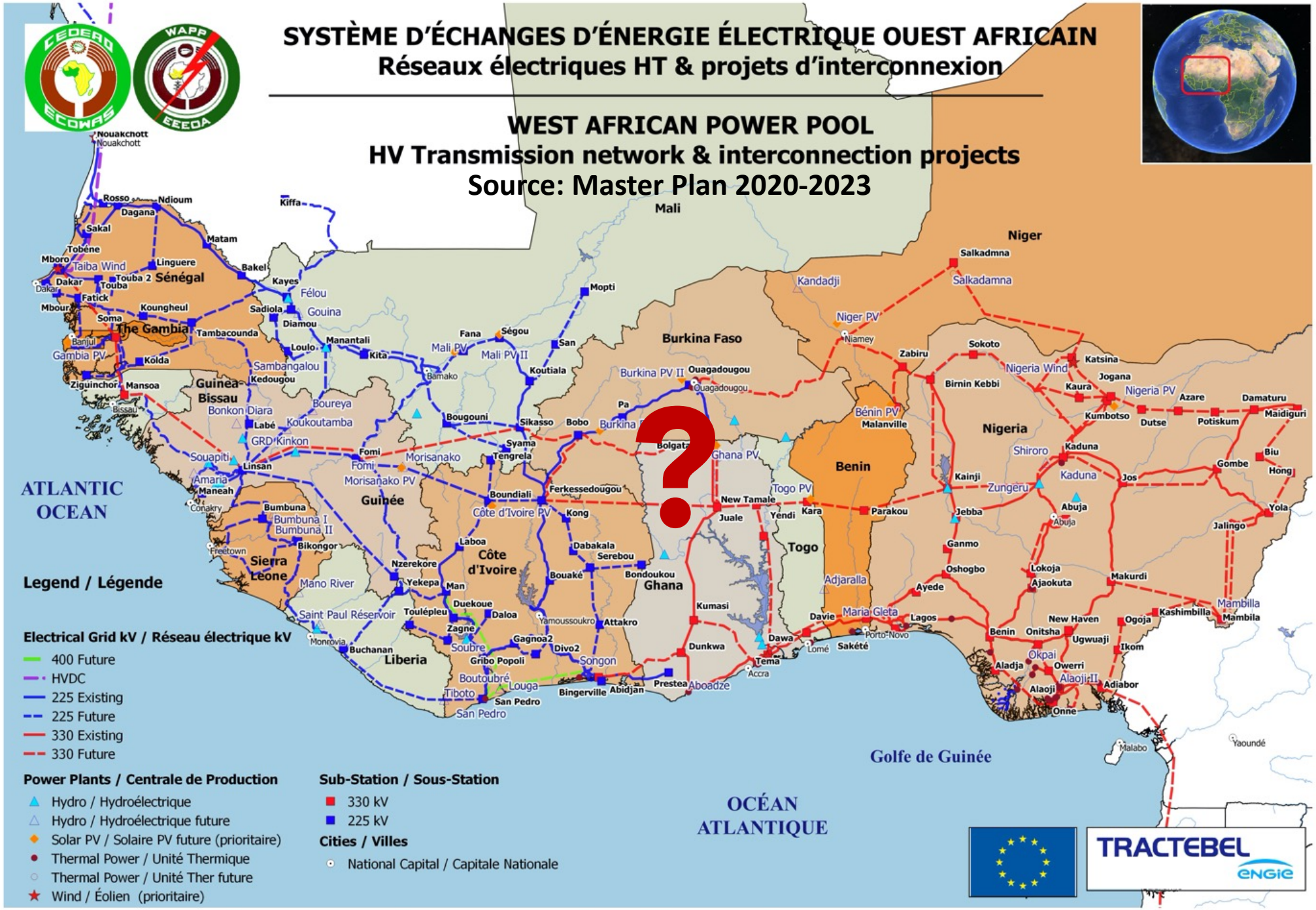
EUROPE


F.Y.R.O.M. - The Former Yugoslav Republic of Macedonia
Greenland (DENMARK)
Jan Mayen (NORWAY)
Greenland Sea
Denmark Strait
Norwegian Sea
Arctic Circle
Barents Sea
Hammerfest
Tromsø
Murmansk
Kiruna
White Sea
Arkhangel'sk
Reykjavík
ICELAND
NORWAY
Luleå
Oulu
Umeå
FINLAND
Lake Onega
Trondheim
Tórshavn
Faroe Islands (DENMARK)
SWEDEN
Gulf of Bothnia
Tampere
Lake Ladoga
SHETLAND ISLANDS
Gävle
Turku
Helsinki
Gulf of Finland
St. Petersburg
RUSSIA
Bergen
Oslo
Stockholm
ÅLAND ISLANDS
Tallinn
ESTONIA
Rockall (U.K.)
ORKNEY ISLANDS
HEBRIDES
Stavanger
Moscow
North Atlantic Ocean
Aberdeen
Göteborg
Gotland
Rīga
LATVIA
Glasgow
Edinburgh
North Sea
Skagerrak
Kattegat
Baltic Sea
Öland
LITHUANIA
Vilnius
Vitsyebsk
Smolensk
Belfast
UNITED
DENMARK
Copenhagen
Malmö
Bornholm
Kaliningrad
RUSSIA
Mahilyow
Minsk
BELARUS
Dublin
Isle of Man (U.K.)
Irish Sea
Leeds
Manchester
Liverpool
Gdańsk
Hrodna
Homyel'
IRELAND
KINGDOM
Hamburg
Brest
Cardiff
Birmingham
Amsterdam
Bremen
Berlin
Poznań
Warsaw
POLAND
Kiev
Rotterdam
NETH.
Łódź
Rivne
London
Celtic Sea
Essen
Leipzig
Wrocław
Cologne
Brussels
Lille
BEL.
Bonn
GERMANY
Prague
Kraków
UKRAINE
English Channel
Guernsey (U.K.)
Jersey (U.K.)
Frankfurt am Main
CZECH REPUBLIC
Brno
L'viv
Chernivtsi
Luxembourg
LUX.
Paris
Stuttgart
SLOVAKIA
Bratislava
Mykolayiv
Chişinău
Strasbourg
Munich
Iaşi
MOLDOVA
Odesa
Nantes
Vienna
AUSTRIA
Budapest
HUNGARY
Cluj-Napoca
LIECH.
Zürich
Bern
SWITZ.
Vaduz
Geneva
ROMANIA
Bay of Biscay
FRANCE
Ljubljana
Zagreb
Bucharest
Constanța
Black Sea
Lyon
Milan
Venice
SLOVENIA
Turin
Bordeaux
Belgrade
Varna
Genoa
SAN MARINO
CROATIA
BOSNIA AND HERZEGOVINA
Bilbao
Toulouse
MONACO
Sarajevo
YUGOSLAVIA
BULGARIA
Sofia
Porto
Andorra la Vella
Marseille
Ligurian Sea
Florence
ITALY
Adriatic Sea
İstanbul
ANDORRA
Skopje
F.Y.R.O.M.
Zaragoza
Corsica
Rome
Madrid
VATICAN CITY
Tirana
ALB.
Thessaloniki
Bursa
PORTUGAL
Barcelona
Naples
TURKEY
Lisbon
Tagus
Balearic Sea
SPAIN
Valencia
Sardinia
Tyrrhenian Sea
GREECE
Aegean Sea
İzmir
BALEARIC ISLANDS
Athens
Sevilla
Cagliari
Ionian Sea
Palermo
Mediterranean Sea
Sicily
Rhodes
Gibraltar (U.K.)
Málaga
Strait of Gibraltar
Ceuta (SPAIN)
Alborán Sea
Melilla (SPAIN)
Oran
Algiers
Tunis
Crete
Valletta
MALTA
Rabat
Casablanca
MOROCCO
ALGERIA
TUNISIA
Scale 1: 19,500,000
Lambert Conformal Conic Projection, standard parallels 40°N and 56°N
0 300 Kilometers
0 300 Miles


Interconnected
network of
ENTSO-E
NORTH SEA
BALTIC SEA
ATLANTIC OCEAN
BLACK SEA
CASPIAN SEA
MEDITERRANEAN SEA

SYSTÈME D'ÉCHANGES D'ÉNERGIE ÉLECTRIQUE OUEST AFRICAIN
Réseaux électriques HT & projets d'interconnexion

WEST AFRICAN POWER POOL
HV Transmission network & interconnection projects
Source: Master Plan 2020-2023

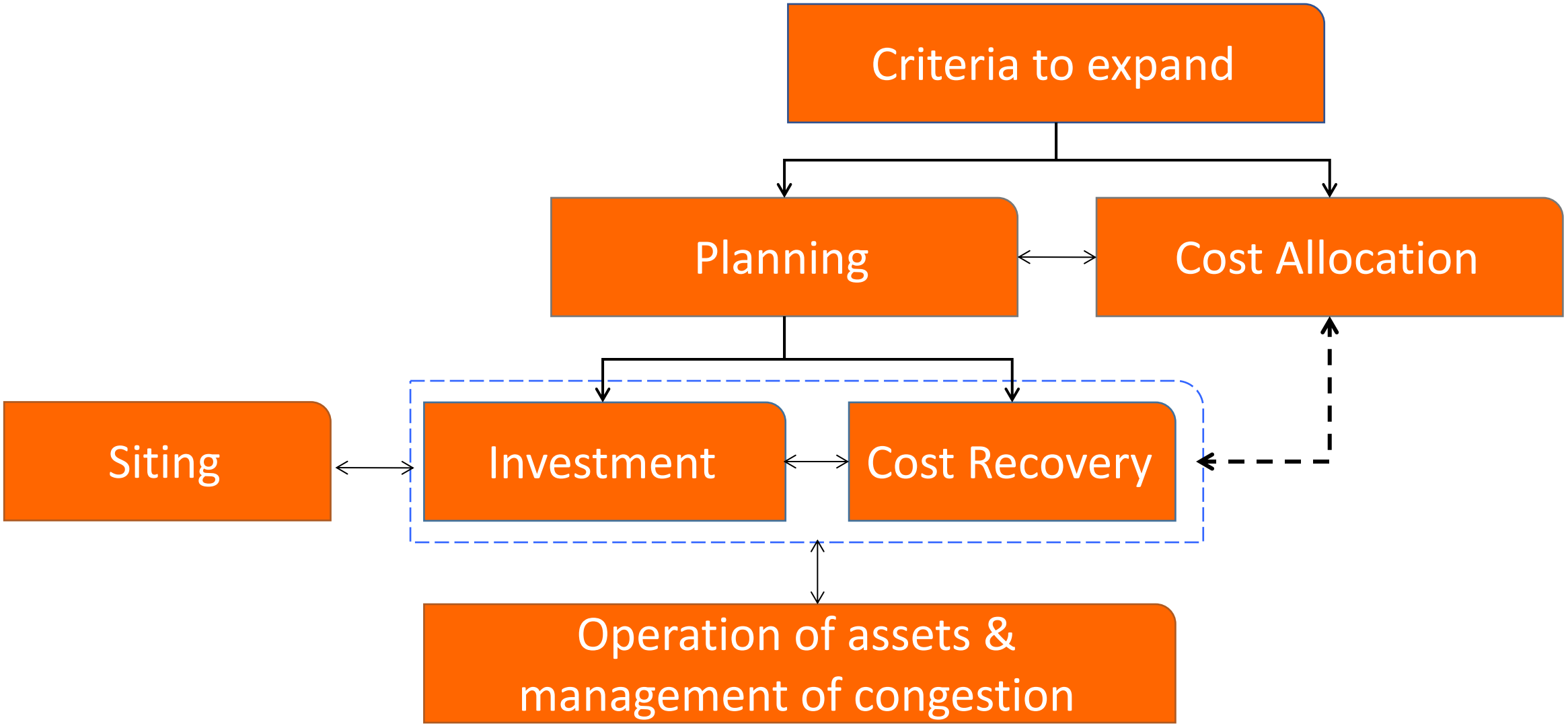


Trust & a regional vision of security of supply

- Generation plants of “regional size” are necessary to exploit economies of scale given the small electrical size of many SSA countries, the uneven location of the best resources & the variability of wind, solar & hydro. Thus
  - some countries must trust their security of supply to power plants located abroad
  - Some countries must build large power plants trusting that off-takers in other countries will honor their contracts, & commit to export power even under situations of national scarcity
- This level of trust, in particular relying on external energy sources to meet the national demand, appears impossible to obtain, thus jeopardizing a truly regional vision of security of electricity supply

The relationship between planning & cost allocation

This the scope of transmission regulation



Transmission investment & unnecessary regulatory risks

Please, let's avoid unnecessary risk in transmission remuneration

- Regulation must try to avoid unnecessary financial risks *(which have negative consequences on the cost of capital)* to a natural monopoly activity like transmission, subject to regulation
  - The next slide offers a list of actions – mostly with origin in flawed regulation – that create unnecessary risk *(therefore perfectly avoidable)* in the remuneration of the distribution activity

Flawed regulation creates investment risks

These are frequent **unnecessary regulatory risks** in the remuneration method

- Revenues that depend on transactions or volume of utilization, instead of the actually incurred costs, or standards, or results of an auction
- Regulatory updates of the historical rate base, based on “replacement costs”, “market value”, or other creative methods
- Failure in ring fencing the transmission revenue requirement in the revenues obtained from the end customer tariffs
- Flawed cost allocation methods that lead to opposition to pay charges that are considered unfair
- Frequent re-calculation of transmission charges or changes in methodology
- Performance-based incentives that go beyond the equipment failure
- Uncertainty in remuneration beyond the economic life of the transmission asset

The best practices in transmission cost allocation

Cost allocation of regional transmission projects

- Avoid "**pancaking**" & charges associated to **commercial transactions**
- Agreement **among countries** for a **stable allocation to countries** of the cost of **major projects**
  - Try allocation to countries based on estimated benefits, otherwise…
  - … **track sources and sinks** of actual or forecasted flows, minimizing the use of extra assumptions
- Tracking sources & sinks allows determining **inter-country compensations**.
  - After that, each country will allocate internally the modified transmission total cost following its own principles.

The format of transmission charges

- Regardless of the method employed to determine the transmission network charge for centralized generators, it remains deciding **how to apply the charges**. **Errors to be avoided**:
  - **Do not apply volumetric charges** ($/kWh) to generators, as this artificially modifies their variable cost & thus their dispatch merit order
  - **Do not apply flat capacity charges** ($/installed kW capacity) to generators, as this may overcharge low utilization generators
  - Try to **apply lump sum annual charges** to generators that are not directly linked to actual recent production, to avoid the two previously described mistakes.

Now, debate

Topics for discussion

- **How to remove the barriers to transmission investment?**
  - In enforcing the plans. In financing the planned infrastructures. No coincidence of regional plans with national priorities. No agreement on cost allocation. Too much risk in cost recovery.
- **Why resistance to adopt sound transmission cost allocation principles?**
  - Avoid “pancaking”. Avoid charging to commercial transactions. Allocate to beneficiaries or (proxy) based on actual physical flows.
  - Allocate cost of regional transmission projects to countries, which will decide how to charge internally.
  - Design the format of the charges to the end network users to avoid creating economic distortions.