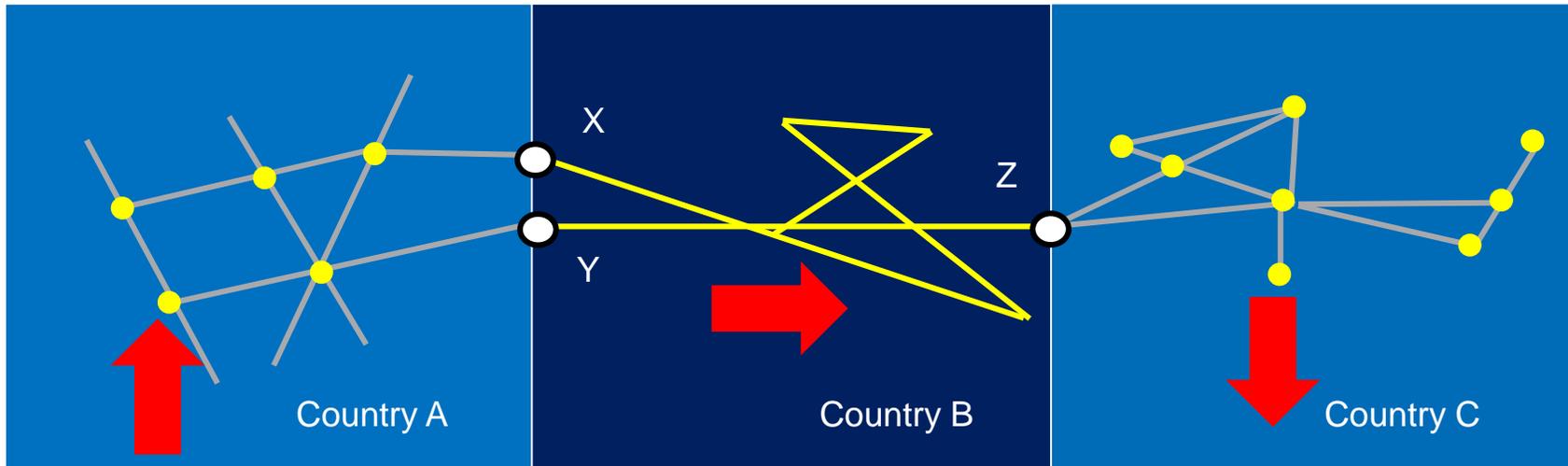




**TA 8830-REG Harmonizing the  
Greater Mekong Sub-region  
Power Systems to Facilitate  
Regional Power Trade  
Summary of WGRI Activities**

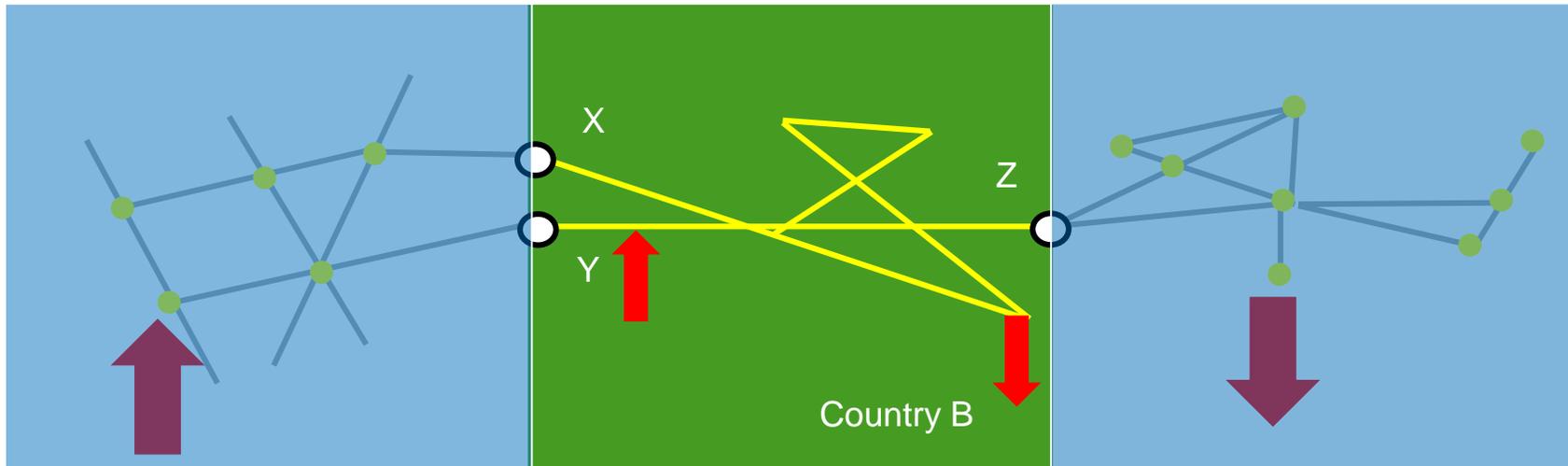


# Transmission Pricing



- Initial work focused on defining a **Methodology for Wheeling Charges (MWC)** covering **power flows between countries** – Report 2 – Third Party Access and Wheeling Charges
- The MWC generates revenues for the transmission utility in Country B, but these will be a relatively small proportion of the total revenue requirement
- **National Transmission Charges** are the main source of revenue for the transmission utilities
- Generally in the GMS these are recovered by **Postage Stamp Charges**
- WGRI members expressed interest in **enhanced Postage Stamp Charging methods** in June 2018, with objectives of:
  - More cost reflective charges
  - More accurate price signals to system users

# National Transmission Charges



- How to recover revenues from national transmission users?
  - Generators
  - Consumers
- How to ensure cost recovery for transmission utility?
- How to encourage efficient use of the transmission network?
- Trade-offs between efficiency, simplicity, stability...
  - Need to find a methodology that is not too computationally intensive
- Discussion began in WGRI in June 2018, in dialogue with EGAT, but looking for a general approach – considering **seasonal and time of day** improvements, amongst others

# GMS Transmission Pricing Methods



Country	Postage Stamp	Contract Path	Distance-based MW-km	Flow-based MW-km	LRMC based nodal/zonal	SRMC-based nodal
<b>Cambodia</b>	Implicit					
<b>PRC</b>	✓	✓		✓		
<b>Lao PDR</b>	Implicit					
<b>Myanmar</b>	Implicit					
<b>Thailand</b>	✓					
<b>Viet Nam</b>	✓					

## Notes:

1. “Implicit” means that in these countries, whilst there is no specific transmission pricing mechanism currently employed, cost recovery for transmission takes place as part of an integrated end-user tariff and all customers are paying the same transmission cost per kWh of energy consumption. A postage stamp method is therefore implicitly being applied.

2. PRC is employing a variety of approaches for different types of transactions (intra-provincial and inter-provincial)

# International Examples of Transmission Pricing Methods



Country	Postage Stamp	Contract Path	Distance-based MW-km	Flow-based MW-km	LRMC based nodal/zonal	SRMC-based nodal
<b>National Charging Schemes</b>						
Australia	✓			✓		
Brazil					✓	
France	✓					
GB					✓	
Ireland	✓				✓	
New Zealand	✓					
Singapore	✓					
<b>Regional Charging Schemes</b>						
Europe (ENTSO-E)	✓					
SAPP				✓		
WAPP (Proposed)				✓		

# Key observations



- Within the broad category of postage stamp charging for electricity transmission there is **considerable variation** in the methods employment by different utilities in order to enhance the strength of the price signals sent to system users.
- Significant work continues to be done on the methods that can be used for measuring utilisation of the network through **flow-based analytical techniques**.
- But there is *a/so* interest in how to modify postage stamp methods to make them more cost reflective:
- Several options:
  1. Differentiation of charges based on **seasonal** and **time of day** considerations;
  2. Application of charges on the basis of **maximum demand** or **maximum generation capacity**, or on the basis of **energy consumption or generation**, or on a **combination of capacity and energy**;
  3. Tariff variation according to the **duration** over which power demand is taken from the system;
  4. Different levels of charge according to the **voltage level** at which users are connected to the transmission system;
  5. The inclusion of simplified **locational signals**, e.g. based on techniques such as the Tilted Postage Stamp approach.
  6. The inclusion of additional factors such as **reactive power** charging.



## Points raised in WGRI discussion

- Questions for the GMS countries:
  - Are the new dimensions introduced, e.g., time of day and time of year; charge to generators and charges to consumers; capacity charges and energy charge; and locational charges can be applied in the GMS power sector/transmission system?
  - Is unbundling a prerequisite for making these sorts of changes, or can this be done already, with oversight from the regulators (either independent or govt. ministries?)
  - Can new factors, once applied, enhance the existing postage stamp scheme?

## Points raised in WGRI discussion



- Many countries have sizable hydro resources, with clear seasonal variation, so there is strong desire to develop and apply **seasonally** varying transmission charges, reflecting changing flow patterns in wet and dry seasons
- Some countries already apply (in variant forms) capacity charges or will consider applying capacity charge in addition to energy (transmission) charge
- Current retailed tariff in all countries already have structures differentiated by consumer categories, which can be further developed for transmission **demand and energy charges**
- Locational charges for generators have limited relevance in countries where generation projects are defined specifically in Power Development Plans
- A more significant challenge is how to identify the costs of the transmission function within vertically integrated utilities
- In countries with more than one network owner, it would be possible for the utility responsible for energy sales to collect uniform postage stamp tariffs and redistribute to transmission owners



# Transco development



- Earlier phases of our work on TA8830 (Report 2) have focused on **third party access** and the importance of having transparent regulations and processes around transmission.
- Internationally, **unbundling of the electricity sector** to separate the transmission function has been part of this:
  - There are many different models and examples of the creation of Transcos to draw on;
  - Key features vary: network ownership and system operation may be combined roles or separate roles...
- We have carried out more work to investigate a range of questions for the GMS:
  - What are the advantages (maybe also disadvantages) of having a Transco?
  - Why and When is a Transco needed?
  - What are the regulatory requirements, licensing needs and commercial agreements required for creating a new Transco?
  - How would the Transco be funded?
  - Which assets would be transferred, and how would their costs be recovered?



- The key reasons why a Transco is needed, as part of a **broader electricity sector reform** process.
  - these can include a combination of technical and commercial issues
  - planning, construction of new assets and operation of the power system.
- The **roles and responsibilities** of the Transco, highlighting the interfaces between the Transco and other power sector participants.
- The appropriate **institutional and regulatory structures** that would support the creation and regulation of the Transco's activities.
  - Given that the Transco functions would form part of a **monopoly activity** in the power sector, it is important to ensure that there is adequate **transparency** in the operation of the Transco to protect users of the transmission network and end consumers of electricity.
- The principles for **funding the Transco**:
  - cost recovery
  - securing revenue requirements and reviewing regularly
- **Transferring assets** to the Transco and the basis on which these would be transferred from the incumbent utility.

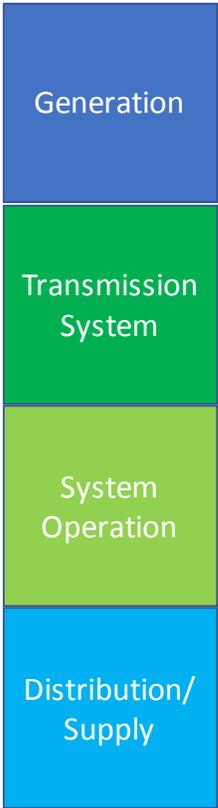
# Transmission Unbundling Options



## TRANSMISSION UNBUNDLING OPTIONS

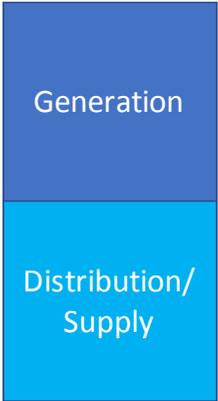
### Status Quo

Vertically Integrated Utility



### Option 1: TSO

Vertically Integrated Utility



Transmission System Operator



### Option 2: ISO

Vertically Integrated Utility



Independent System Operator



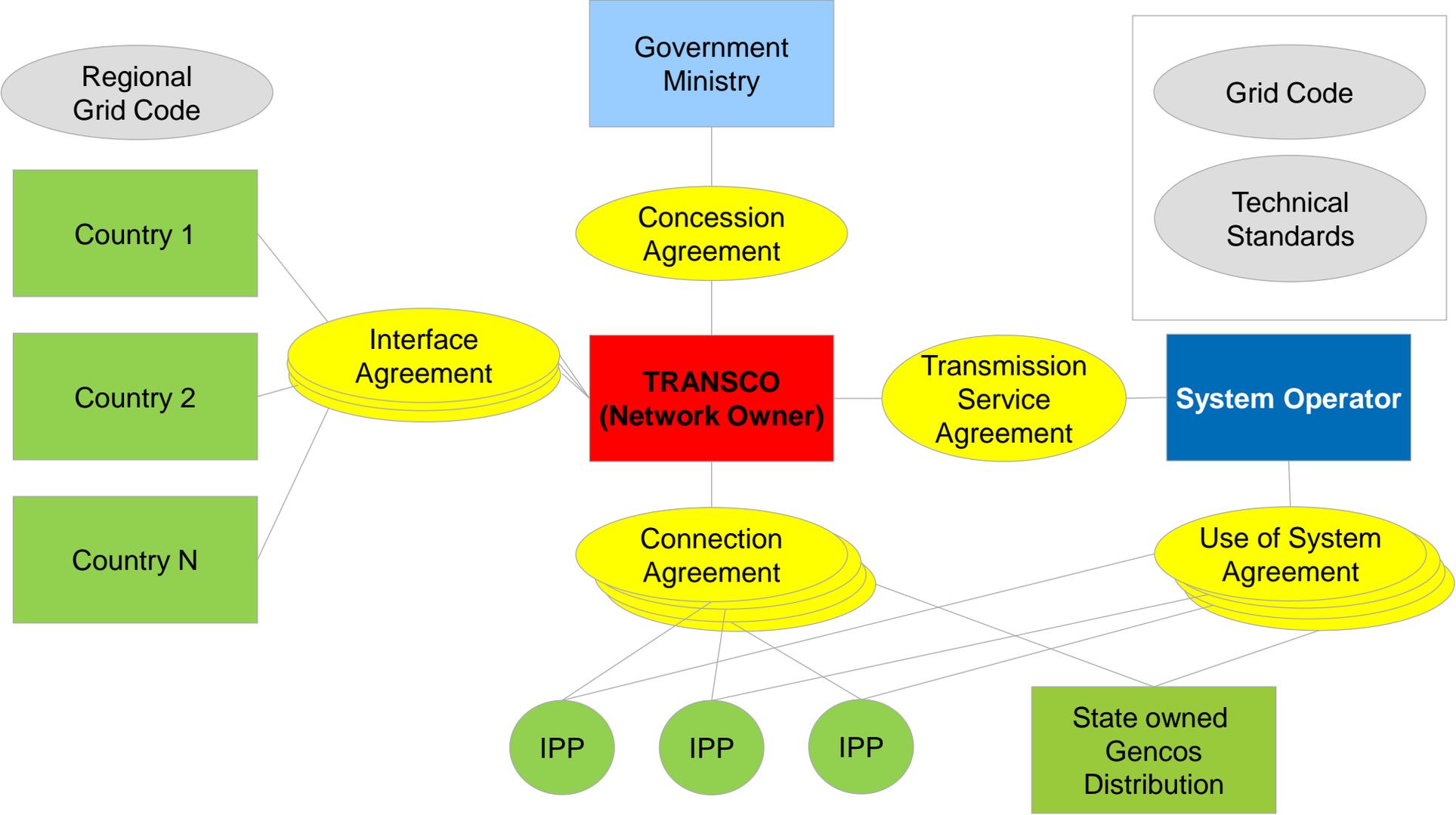
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### Option 3: ITO

Independent Transmission Operator



# Possible regulatory structure for Transco





- There are many good reasons for establish transmission as an independent function from other activities, especially separating from generation, particularly to **facilitate third party access**.
- **Models are fairly well defined**, key issues are how best to meet a number of objectives:
  - New investment in transmission;
  - Level playing field for all electricity sector participants;
  - Meeting the needs of both power system operation and electricity market functions.
- **Regulatory issues are significant**:
  - Transmission is still a natural monopoly, however we organise it;
  - Complex range of licences and agreements required to protect all parties.
- Note the connection with **transmission pricing/cost recovery**:
  - An integrated approach is required to ensure financial viability of Transcos;
  - Important to remember that the residual element of charges is important;
  - Without a financially viable Transco, market and system operation would be jeopardised.



## Points raised in WGRI discussion

- All countries acknowledge the advantage of Transco, namely relieving the financing burden by the governments
- A variety of Transco models are currently being explored in the GMS countries, and some of these are evolving
- Even in situations where there is a vertically integrated utility, e.g. Thailand, steps are underway to ringfence the Independent System Operator function and expose this to clear regulation
- Different models are being explored involving state ownership of the Transco (Thailand, China), potential private ownership (Lao PDR)
- It is possible to take the generic model shown and adapt it to many of the specific situations in the GMS – noting that in Cambodia, for example, EDC is both the system operator and single buyer, but there are 4/5 different transmission owners



## Next Steps



## Overall comments from WGRI members

- In many countries the **enabling environment is already in place** to enable the sorts of developments in pricing and Transco organisation that were discussed
- It was noted that Transcos can be “for-profit” organisations, especially if they have private investors. **Ancillary services costs** need to be recoverable by the Transcos through charges. Wheeling charges need to recover an element of **capital cost** as well as just **short-term operating costs**, as a contribution towards the sunk costs of system assets
- **What issues remain for the WGRI to address?**
  - Developing the basis for trading energy in the region, as opposed to wheeling charges etc. This could begin with simple, **pilot bilateral trades** developed as a paper exercise to test pricing principles (the early development of Nord Pool was quoted)
  - Practical steps for the region, based on international experience, which has now been fully researched. Need to move from **research to implementation**.
  - There will always be country-specific factors to be considered in Transco organisation and network pricing, but **pilot studies of how trading could work** are important
  - This should include examining the effects on charges of **wheeling through multiple countries**
  - Should consideration be given to having a **single Transco** for the region?
  - More **capacity building** in trading practicalities will be required in the region



**Thank you!**



# Road Map

# Objectives of Transmission Pricing Road Map



- At the RPTCC-24 Meeting in June 2018 it was agreed that a Road Map should be developed for integrating regional and national wheeling charges.
- The **key purpose of a road map** for implementing transmission prices is to **set down the overall strategy for achieving successful implementation of the methodology for wheeling charges** and any revisions that may be required to the national transmission pricing arrangements in the GMS countries.
- This includes a number of stages:
  - The completion of a set of **case studies** demonstrating specific aspects of the wheeling charge application, as discussed by the WGRI and RPTCC in June 2018;
  - The development of **national regulatory processes and procedures**;
    - including the changes to national transmission tariff regulations;
  - The completion of regulations and licences supporting **third party access**;
  - The development of a detailed **calculation procedure for developing the wheeling charges themselves**; and
  - Liaison with GMS power sector stakeholders to make them aware of the licensing and charging regimes that are being put into place.

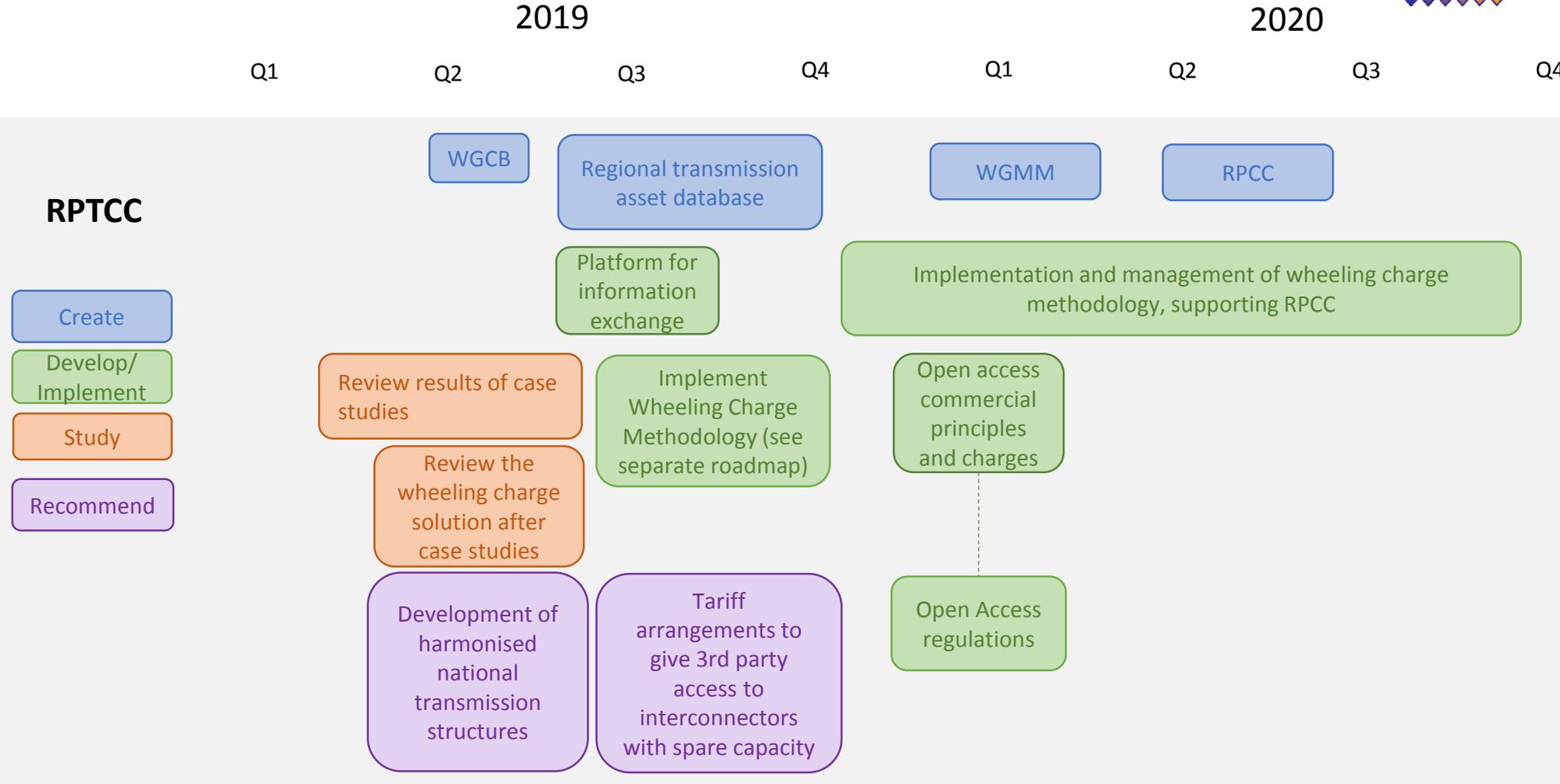


- The Road Map seeks to bring all these recommendations together and to show all the major steps that are required to implement wheeling charges successfully.
- A first draft of the Road Map has been prepared to show the possible format and level of detail – this is *for discussion* and is not the finished article.
- The Road Map shows activities that are required over a **two-year time-frame**, with **indicative phasing** of tasks.
- It also splits the responsibilities for different actions between relevant stakeholders and organisations, as follows:
  - The **RPTCC** – as the highest level body making authorising new transmission charging arrangements, and responsible for the work of existing and new working groups and bodies (including the RPCC);
  - The **WGRI**, where much of the work on developing new regulations and final implementation of the wheeling charge methodology will be focused;
  - The **WGPG (or WGPO)**, which has ongoing responsibilities for the development and implementation of a regional Grid Code and will coordinate regional planning activity.



- Other parties with responsibilities:
  - A proposed new **Working Group on Capacity Building (WGCB)**, which will have responsibilities for ensuring that GMS Stakeholders are fully familiarised with the opportunities for undertaking cross-border trading and the regulations and procedures involved;
  - A new **Working Group on Market Monitoring (WGMM)**, which would monitor cross-border trading and review PPAs or any inter-company transactions that are entered into by the electricity companies in the GMS for compliance with the relevant regulations;
  - The **power utilities and/or government agencies** in the GMS Member Countries, who will have specific responsibilities for supporting the calculation and implementation of new transmission tariffs in an integrated way; and
  - The new **Regional Power Coordination Centre (RPCC)** - as and when this is established.

# RPTCC Activities





- There is overall support for the concept of developing a road map for implementation of wheeling charges in this sort of format
- The importance of specific activities such as the development of a regional transmission asset database was noted – getting an agreed database of standardised costs will be very important for calculating wheeling charges
- There is a need for a broader roadmap of activities than just the wheeling charge tasks – this should be integrated with a road map of WGPO work
- The possibility of creating new working groups was noted
- The road map must be a practical document and not seek to be a “perfect” description of the ideal way of implementing changes