



Shadow Trading – agenda for 12 December

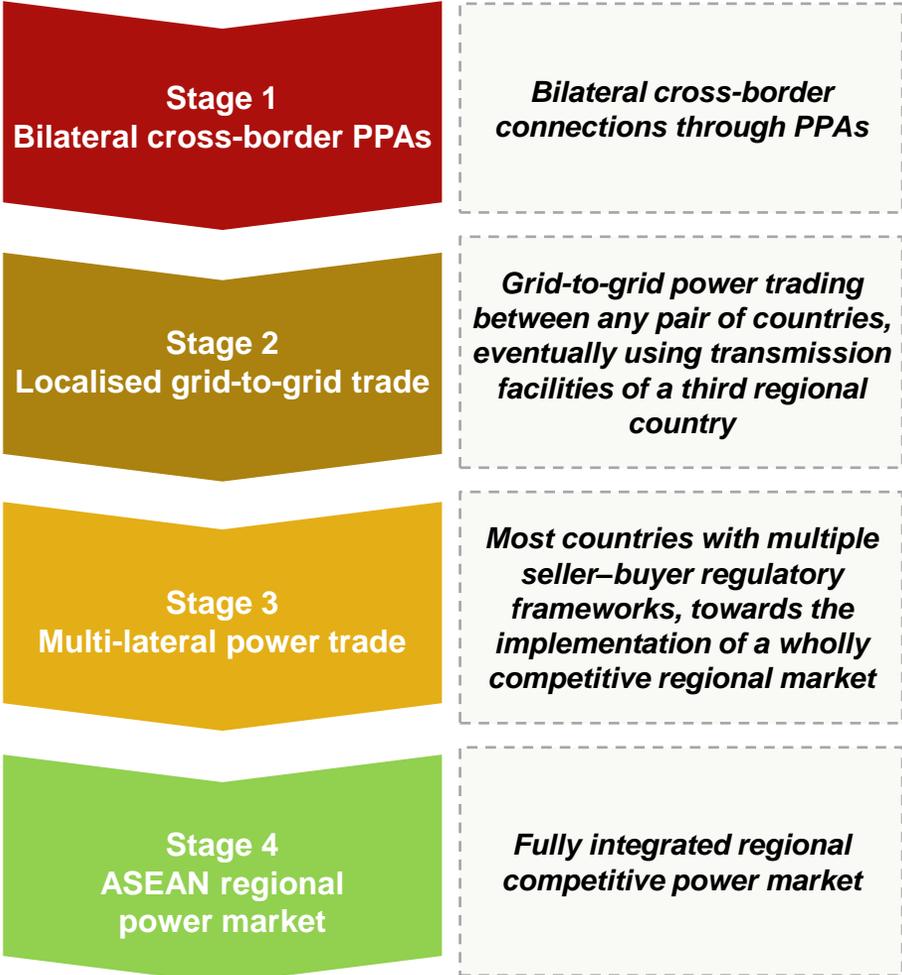
Jakarta: 11 December 2024

Shadow Trading – programme for 12th December

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|--------------------------|---|
| 08:45–09:15 (30 mins) | Regional Power Market (RPM) Development in the ASEAN Power Grid (APG) Roadmap and Minimum Requirements for Multilateral Power Trade in ASEAN by ACE |
| 09:45–10:15 (30 mins) | Leveraging India's Electricity Market Experience: Insights for Regional Power Market and Shadow Trading |
| 09:45–10:15 (30 mins) | Shadow Trading: Building Confidence and Evidence for the ASEAN Regional Power Market Development by Ms. Hyunjung Lee, GMS/ASEAN Energy Program Lead, ADB |
| 10:30–11:30 (60 mins) | Market Options, Trading Principles, Pricing Mechanisms, Bidding, and Settlement by Mr. Jonathan Hedgecock, ADB Consultant |
| 11:30–12:30 (60 mins) | Facilitated discussion: Regional Power Market principles and practicalities This session will enable participants to share their experience of cross-border trade to date and their questions regarding the implementation of a regional power market |
| 13:30–14:30 (60 mins) | Shadow Trading: The Market Model, Operating Arrangements, Risk Management and Experience from Other Markets by Mr. Hans-Arild Bredesen, ADB Consultant |
| 14:30–15:30 (60 mins) | Facilitated Discussion: Operationalizing Shadow Trading This session will introduce the issues to be considered and actions that need to be taken by potential participants to prepare for shadow trading. |

Accelerated energy transition with renewable integration requires more **flexible and short-term trading platform such as a regional power market (a day-ahead market)**

Four key stages of regional power trade evolution



Key points

The progression of regional power trade does not adhere to a sequential process.

- Various approaches, including bilateral trade, multilateral trade, and regional power markets, can and should coexist, each bringing unique advantages and strengths that collectively enhance the effectiveness of regional power trade and thereby, energy transition endeavors.

Rapid growth of renewable energy sources and their inherent volatility and variability present huge benefits for establishing a short-term and flexible regional market platform.

- Regional day-ahead market can provide an important platform for enabling power purchases to be optimized for the short-term, enabling power utilities to complement long-term bilateral trades with more flexible trades and allow for the management of congestion and transmission capacity.

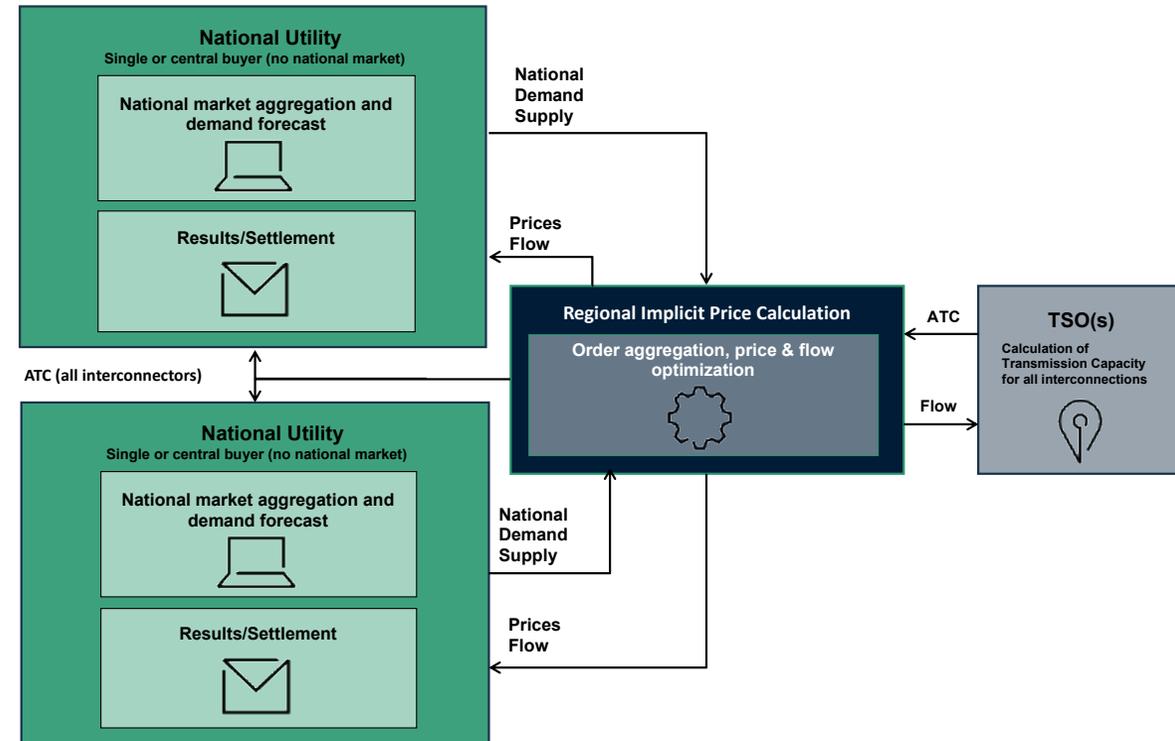
To harness the advantages of multilateral power trade, it will be essential for member countries to take a decisive and bold step forward with initiating a pilot regional power market.

A regional power market (day-ahead market) shadow market operation under the governance of ACE aligned with the MPT roadmap

The starting point in a regional market is to establish a common methodology for the management of cross-border flows and prices

- **Harmonized rules for congestion management and transmission capacity allocation** – how to manage flows on the borders needs to be agreed upon, the national TSOs will play a vital role
- **Common market rules for regional trading** – flexible rules that cover the regional (not national) trading
- **Define the interfaces between the national and regional markets** – ensuring the same data is used in the regional market without requiring changes to the internal organization of the national power sector
- **Use of an Implicit auction** – meaning that the result shall optimize the utilization of the cross-border capacity as part of the price formation
- **Reporting** – important data for all participants available for all at the same time

Starting point



ATC - Available Transmission Capacity
TSO - Transmission System Operator

A cooperative setup between participating countries will be sufficient, not a new entity setup

Shadow trading

Learning from a dry-run operation, expanding capacity, and improving market design

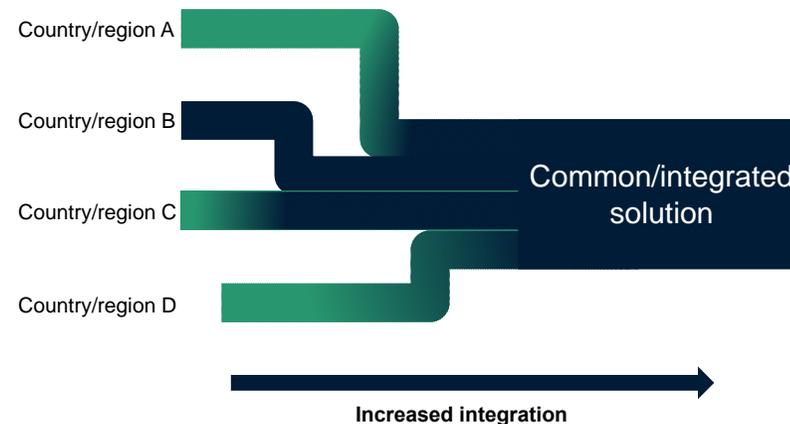
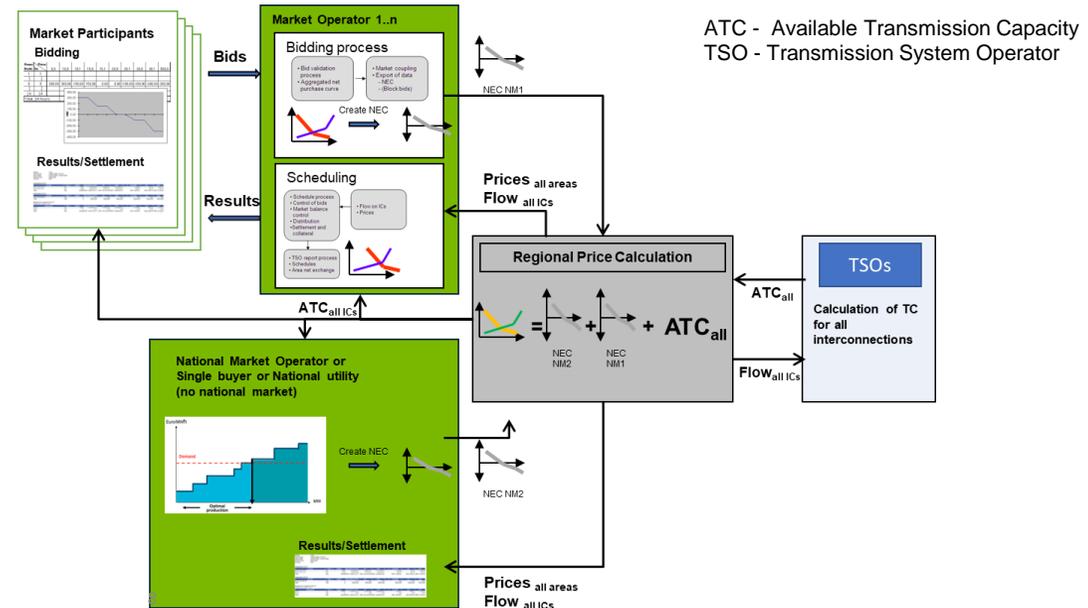
The evolution of the regional market will be **stepwise and shall allow for different developments in different countries/regions.**

National market deregulation – this will open for a different management of the national interface to the regional market but still the benefit and management of the regional market can remain.

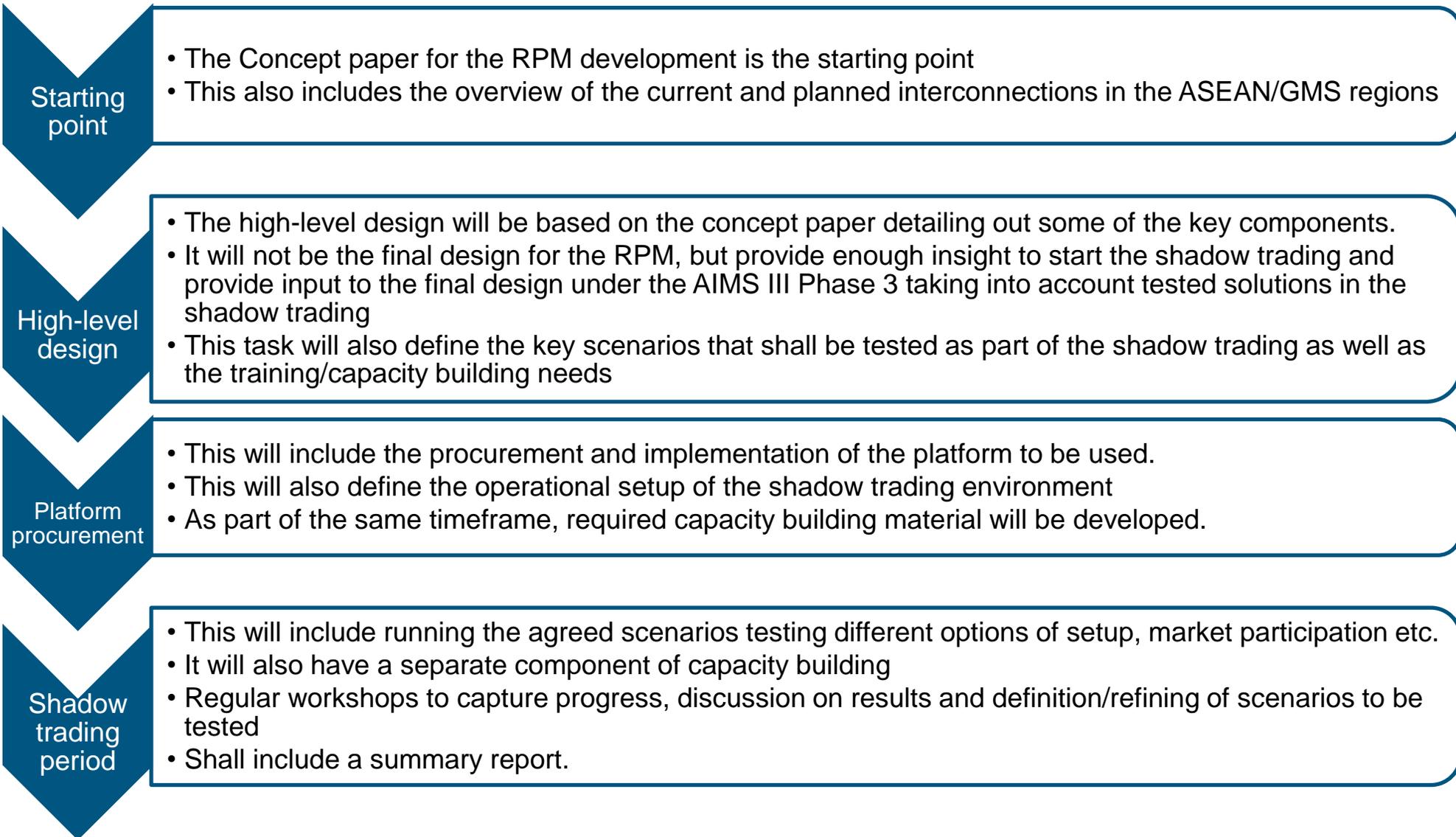
Gradual expansion of markets/products and geographical expansion. Supported by both the MPT roadmap, the IEA Feasibility study, ERIA report as well as the Concept note, stepwise is the key.

Support of both ASEAN-wide and regional initiatives. This could all be demonstrated in the shadow trading.

It is therefore imperative that the regional market has this flexibility in all aspects of its rules and regulations.



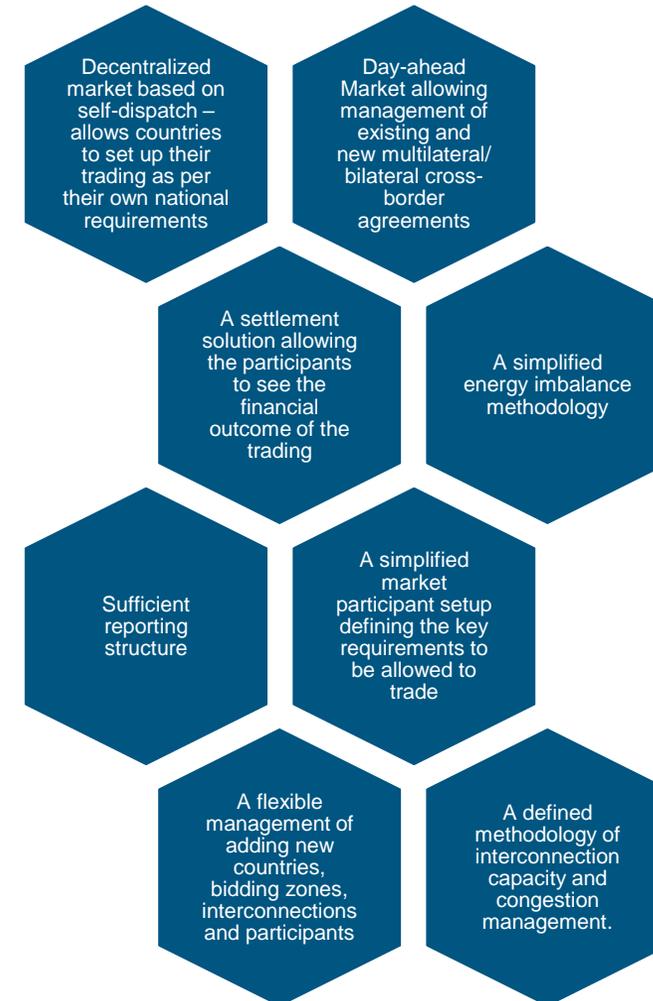
High-level content of the key phases for the shadow trading project



Shadow trading development

The Shadow trading will be based on the fundamental building blocks and flexible approach as outlined in the regional market overview in two previous slides:

- A decentralized market based on self-dispatch – allowing the participating countries to set up their trading as per their own national requirements;
- A Day-ahead Market with the opportunity of also managing/demonstrating existing and potential new multilateral/bilateral cross-border agreements;
- A settlement solution allowing the participants to see the financial outcome of the trading;
- A simplified wheeling and energy imbalance methodology;
- Sufficient reporting structure;
- A simplified market participant setup defining the key requirements to be allowed to trade
- A flexible management of adding new countries/bidding zones/interconnections and participants
- A defined methodology of interconnection capacity and congestion management.



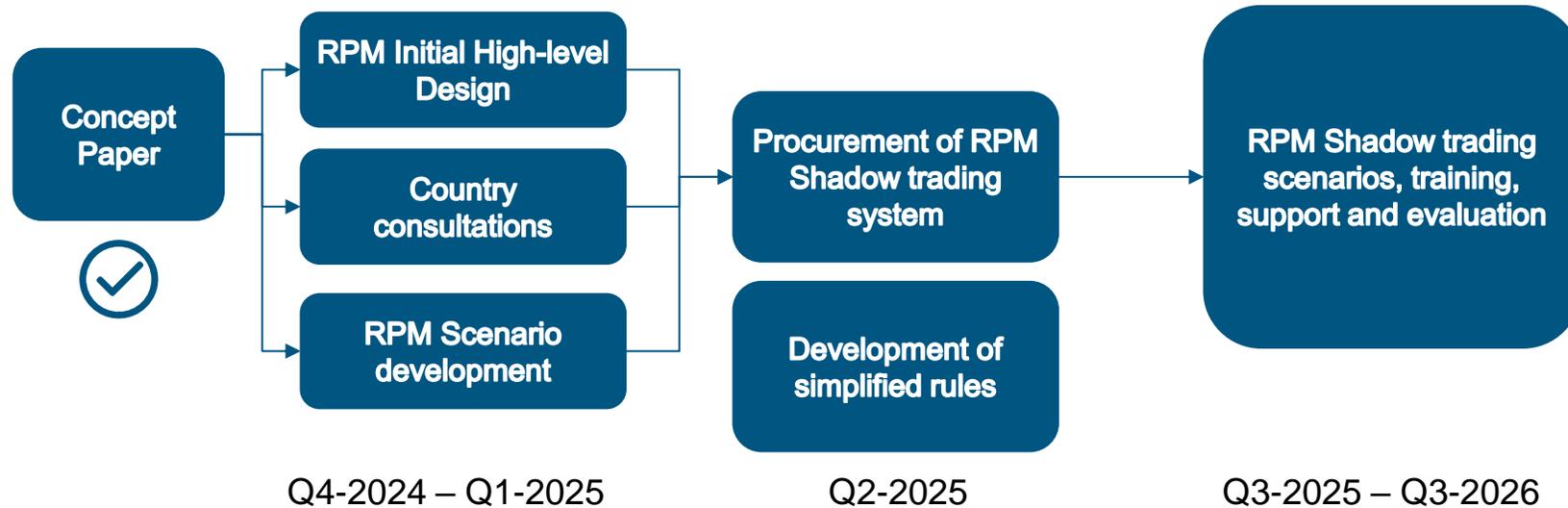
Shadow trading – allowing for demonstrating different options

The Shadow trading will have a flexible approach allowing to demonstrate different setups for an enduring solution:

- Demonstrating different bidding zone and geographical configurations (either having one bidding zone per country, different sub-national bidding zones or regional bidding zones covering more than one country). This will also allow to demonstrate regional solutions with different setups and how they could be coupled;
- Demonstrating different bidding strategies (portfolio or company-based, unit-based or combinations, national utility trading, allowing for IPPs/private companies to participate);
- Allowing for different trading units and currencies;
- Management of bilateral cross-border agreements;
- Market participation flexibility (allowing for different trading strategies and setup for participants in the regional market);
- Demonstrate other potential trading products and markets that could be part of a future regional market like a contracts market
- Showcasing different market clearing algorithms (marginal price, pay-as-bid, weighted average pricing)
- Different pricing methodologies for wheeling and losses
- Could demonstrate an integrated cash flow for a REC market



High-level implementation plan for the shadow trading



This fits well with the MPT roadmap where the Shadow trading can be used as the “show room” and test bed for successive market design as covered by AIMS III studies.

It will allow stakeholders to get a better understanding of the different choices and see the effects of the various markets/products.



Lao Thailand Cambodia (LTC) Trade – next steps

Jakarta: 11 December 2024

Background

- Discussions took place in the Regional Power Trade Coordination Committee (RPTCC), meetings 26 through 29, and in a dedicated meeting in April 2020, developing a pilot LTC three-country trading example;
- The power system studies carried out under AIMS III Phase 2 have prioritised 18 regional interconnections, which include

APG Project No.9 Thailand - Lao PDR

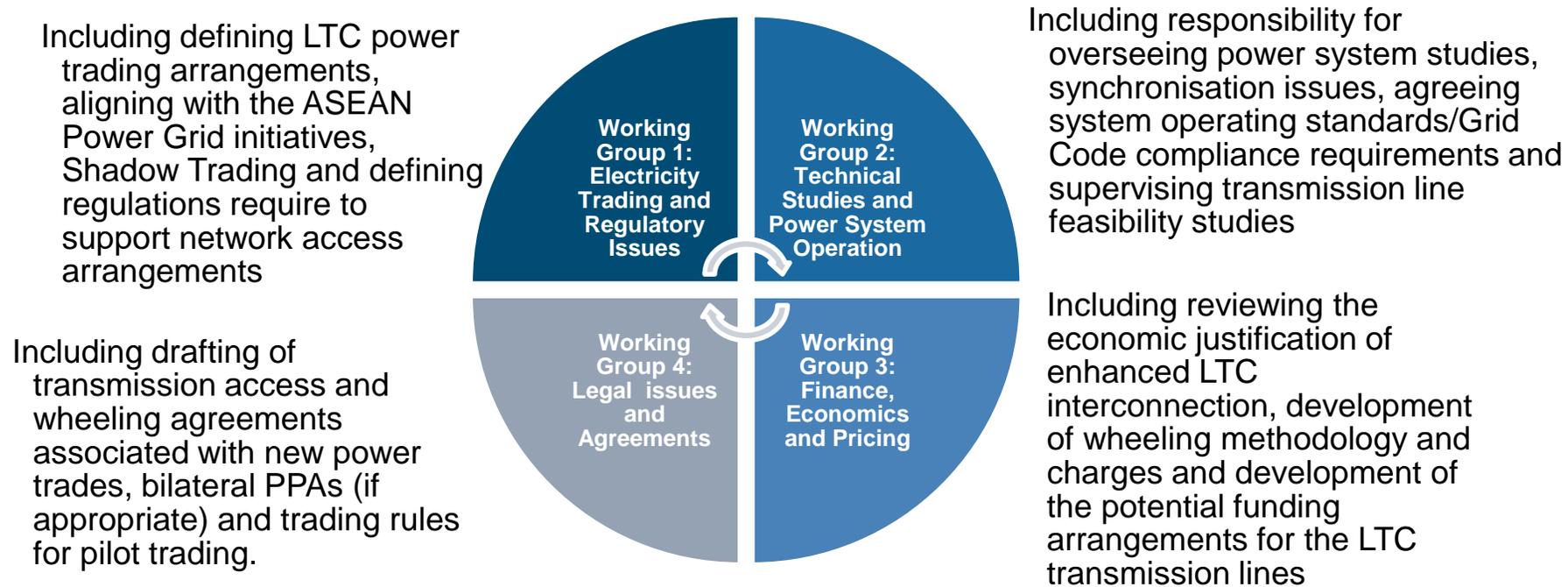
- Ubon Ratchathani 3 – Lak 25, Lak 25 – Ban Hat and Ban Hat – Strung Treng
 - 500 kV HVDC cross-border transmission interconnection from Ban Lak 25 to Ban Hat substation, extending to the Lao-Cambodia border (L-T-C)
- Terms of Reference for a feasibility study of the Ban Lak 25 – Ban Hat transmission line have been developed by the ADB;
 - The ADB has also initiated the APG Financing Facility (APGFF) as a mechanism for funding regional transmission reinforcements that will support the expansion of regional power trade;
 - The ADB has completed a scoping study for a Regional Power Market, and is developing the Shadow Trading proposal

Next steps

- Representatives from Lao PDR, Thailand and Cambodia met yesterday to discuss priority next steps – each country fielded at least one representative from its Energy ministry and one from the national utility
- Four priority areas of work were agreed:
 1. A **study of the power import and export scenarios** that could be envisaged in different resource sharing scenarios, taking account of
 - future demand in Laos, Thailand and Cambodia,
 - seasonal effects on hydro, wind and solar generation and
 - the capacities of current and proposed future transmission lines;
 2. A technical study to investigate **synchronisation issues** between Laos, Thailand and Cambodia
 - recognising that different parts of the Laos system are synchronised with Thailand and Cambodia
 - considering issues associated with Cambodia's synchronous operation with Vietnam
 3. Development of **commercial options** for trading, including bilateral contracting, pilot short-term trading (which could be linked with the Shadow Trading project) and other options
 4. Development of **wheeling charges** to cater for the different trade scenarios

Proposed organisation of future work

- The group agreed that four Working Groups should be created, to address each of the priority activities
- This would model the positive experience gained with the LTMS project, developed by four working groups focusing on Technical, Commercial, Legal and Tariff issues



- These WGs could be consolidated to 3, each chaired by one of the LTC countries