

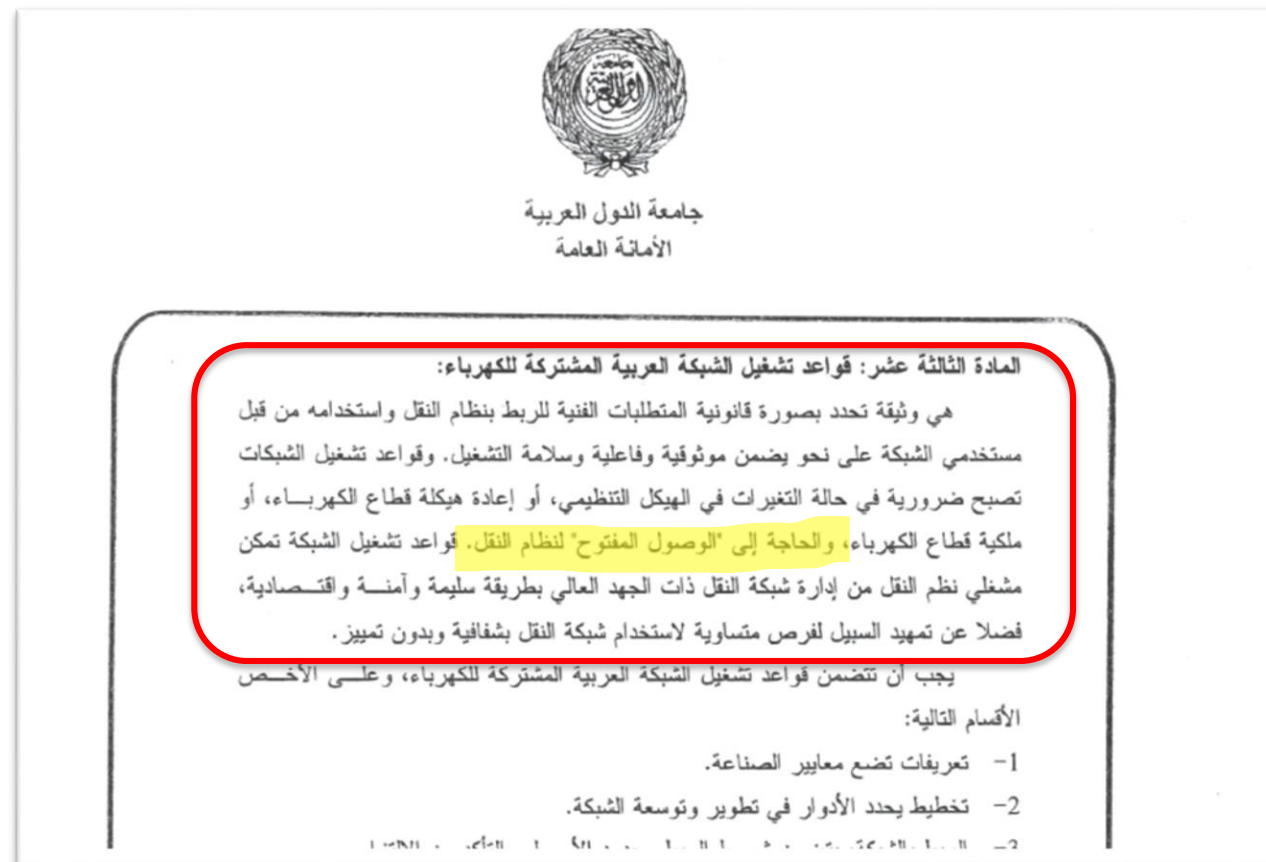
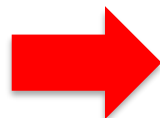
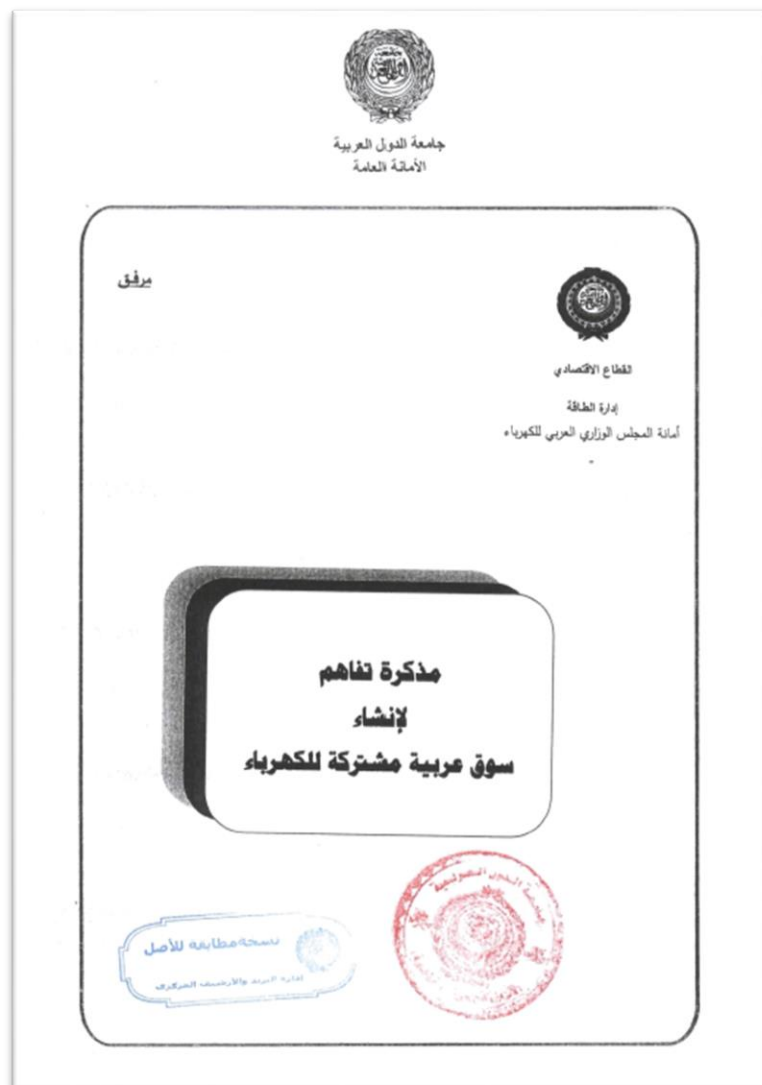
# Transmission Access & Pricing

Considerations for PAEM  
May 2024

# AGENDA

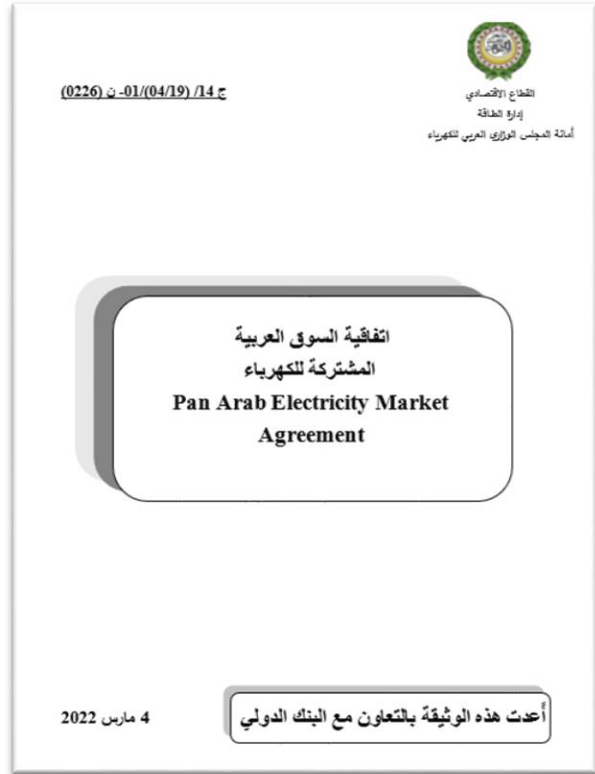
1. Why do we need to set transmission tariff?
2. Design criteria and considerations
3. Considerations for PAEM

# Why are we discussing the topic?





# Why are we discussing the topic?



**3.3.1.6** The direct sale of Energy bilaterally is supported in the PAEM, but regional trading platforms (power exchanges) may also be available in the PAEM. The cost of transactions in the case of bilateral trading is negotiated outside the PAEM, but a bid-based system may be used to make transmission service available. Trading platforms (power exchanges) may provide an implicit auction capacity management system. The Regional Market Facilitator shall be responsible for scheduling bilateral transactions.

**3-1-3-6** تدعم السوق العربية المشتركة للكهرباء البيع المباشر الطاقة على الصعيد التتائي، لكن يجوز كذلك توفير منصات التداول الإقليمية (بورصات الكهرباء) في السوق العربية المشتركة للكهرباء. ويجري التفاوض بشأن تكلفة التعاملات في حالة التجارة التتائية خارج السوق العربية المشتركة للكهرباء، ولكن يجوز استخدام نظام قائم على تقديم عطاءات للحصول على خدمة نقل الطاقة. وقد تتيح منصات التداول (بورصات الكهرباء) نظام إدارة ضمنية لقدرة المزادات. ويتولى وسيط السوق الإقليمية مسؤولية جدولة التعاملات التتائية.

## 3.7 Transmission Service

**3.7.1** PAEM Participants shall have open, fair and non-discriminatory access to the domestic Transmission Systems of Member States to support their transactions in the PAEM. A Transmission System includes all domestic facilities that are deemed to be part of the transmission network, and all International Interconnections. The Arab TSOs Committee shall Publish guidelines for identifying the facilities which form part of the domestic transmission network for the purposes of determining a Member State's Transmission Service Charge.

**3.7.3** The Pan-Arab ARC shall be responsible for developing a methodology for determining Transmission Service Charges. Each National TSO and Sub-Regional TSO shall be responsible for developing and submitting its transmission services charge to the Pan-Arab ARC for review. Following its review, the Pan-Arab ARC shall forward the proposed Transmission Service Charges along with its recommendations to the Ministerial Council for approval. Once approved, the Regional Market Facilitator shall Publish the Transmission Service Charge for each Member State on its website, and shall invoice PAEM Participants for international transactions in the PAEM according to the Published Transmission Service Charges.

## 7-3 خدمات النقل

**1-7-3** يجب أن يكون للمشاركين في السوق العربية المشتركة للكهرباء إمكانية الوصول المنصف والمفتوح والعادل وغير التمييزي إلى أنظمة النقل المحلية للدول الأعضاء لدعم تعاملاتهم في هذه السوق. ويتضمن نظام النقل كل المرافق المحلية التي تعتبر جزءاً من شبكة النقل وكل خطوط الربط الدولية. وتنتشر اللجنة العربية لمشغلي أنظمة نقل الكهرباء إرشادات لتحديد المرافق التي تشكل جزءاً من شبكة النقل المحلية لغرض تحديد رسوم خدمات النقل للدولة العضو.

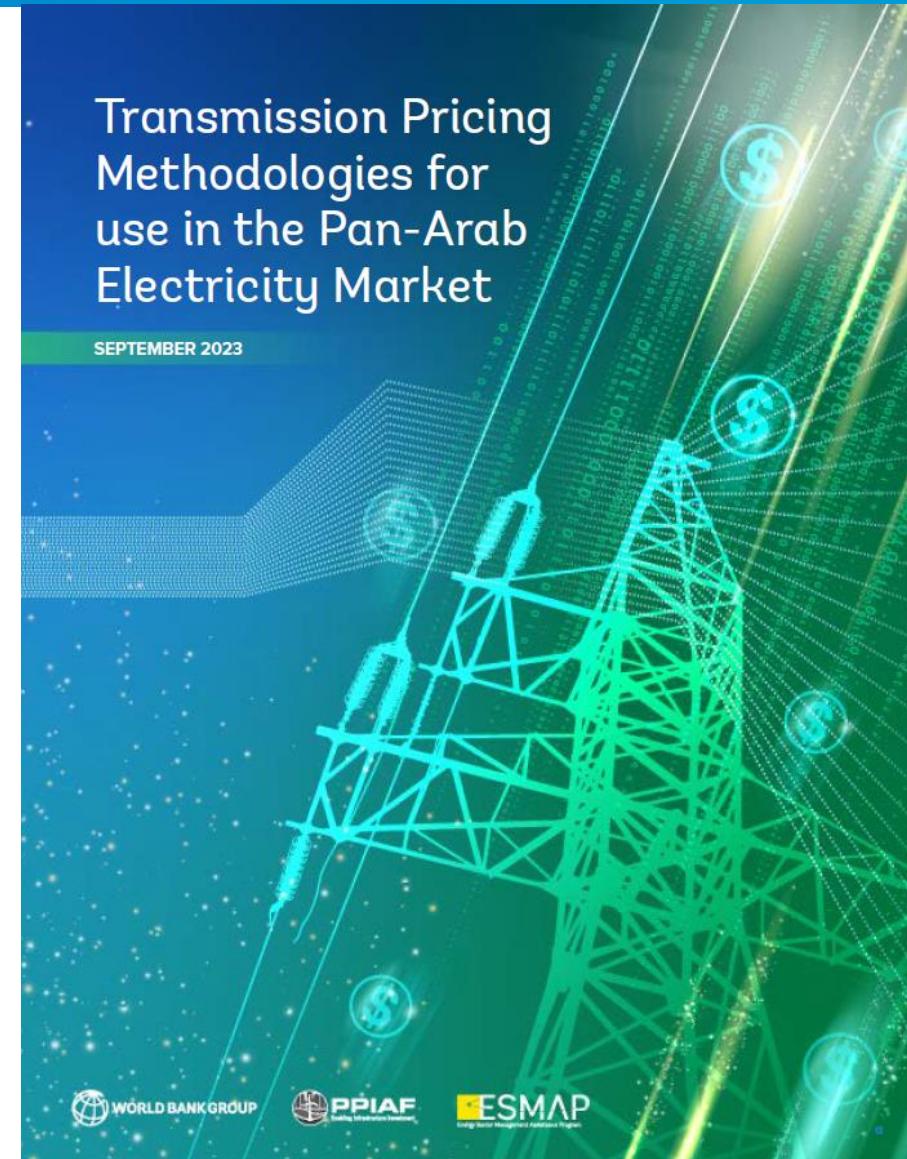
**3-7-3** تكون اللجنة العربية الاستشارية والتنظيمية مسؤولة عن وضع منهجية لتحديد رسوم خدمة النقل. ويكون كل مشغل لأنظمة النقل الوطنية ومشغل أنظمة النقل الإقليمية الفرعية مسؤولاً عن وضع رسوم خدمة النقل الخاصة به وتقديمها إلى اللجنة لمراجعتها. وعقب هذه المراجعة، يجب على اللجنة العربية الاستشارية والتنظيمية إحالة رسوم خدمة النقل المقترحة إلى جانب توصيات اللجنة إلى المجلس الوزاري للموافقة عليها. وبعد الموافقة، يجب على وسيط السوق الإقليمية نشر رسوم خدمة النقل لكل دولة عضو على موقعه الإلكتروني، ويجب عليه إصدار الفواتير للمشاركين في السوق العربية المشتركة للكهرباء عن التعاملات الدولية في هذه السوق وفقاً لرسوم خدمة النقل المنشورة.

# The World Bank Report on Transmission Pricing for PAEM


The purpose of this report is twofold:

1. Provide background material on what constitutes mainstream regulatory practice concerning transmission tariff in several regional jurisdictions.
2. Discuss considerations to develop a uniform transmission tariff methodology for pricing wheeling transactions in the near term in PAEM.

*The draft report was shared for feedback with all the concerned stakeholders back in November 2023 (via LAS). We thank the teams for the very useful and constructive feedback to improve the quality of the report and add clarity as applicable.*



# Open and Non-Discriminatory Access



“Open” means that all market participants have access to transmission system

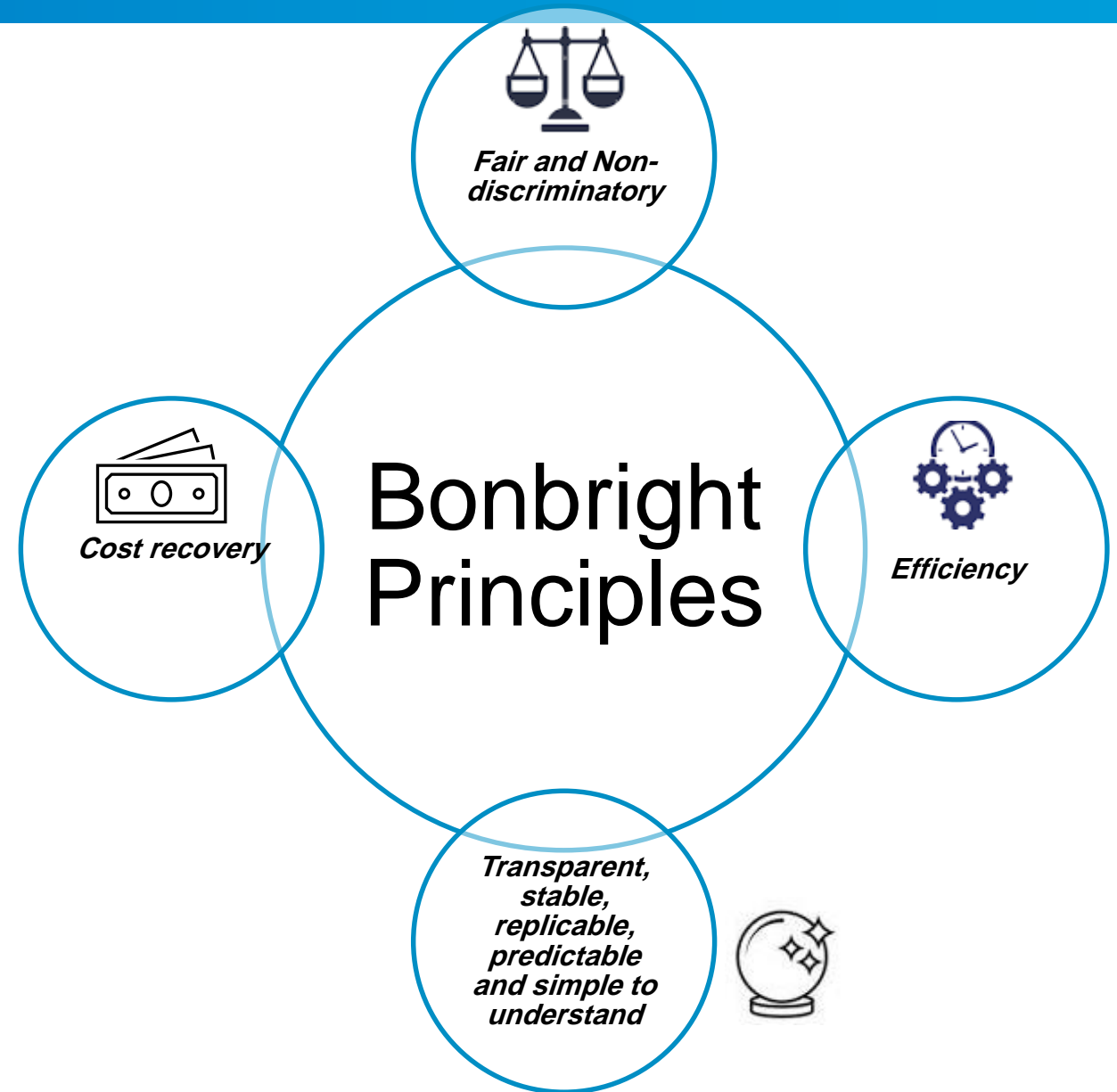
“Non-discriminatory” means that market participants pay similar prices for similar levels of service

- Regulators provide oversight and enforcement to ensure access is fair and open
- The transmission access regime is generally administered by the TSOs/ISOs/RTOs via the dispatch, congestion management rules and transmission pricing regime
- To ensure fairness, market participants with similar transmission service requirements are subject to similar tariffs
- Rules and prices are transparent and readily available to everyone, generally via publication on the TSO website

# Tariff Setting Principles/Objectives

The transmission tariff methodology should:

- Exclude any national subsidies for transmission assets or services.
- Evolve over time as the need arises via the rules change process included in the Market Rules, once developed



# Tariff Setting Principles/Objectives

Objective	Explanation
① Revenue Recovery	Ensure that the network operator can recover the revenue required for the network service.
② Economic Efficiency	Pricing design should provide adequate short and long-term signal to the network operator to operate, maintain and expand the network.
③ Efficient Regulation	The pricing methodology should encourage efficient operation, while keeping a manageable regulatory burden.
④ Complexity & Transparency	Highly sophisticated approaches might promote efficiency at first sight but may appear as a "black box" to network users.
⑤ Non-Discrimination	Level playing field should be created for all users. Users are treated equally irrespective of size, ownership or other factors.
⑥ Stability & Stakeholder Acceptance	Price changes may result when changing the pricing model. This will have an impact on all stakeholders. Mitigation measures may be required.
⑦ Macroeconomic Constraints	Policy objectives like inflation control and regional development policy may present additional challenges for the tariff design.



# Cost Components for Transmission

## Transmission infrastructure

- Capital and O&M related to the Grid investments
- Differentiate between the Deep Network Facilities and the Connection Facilities

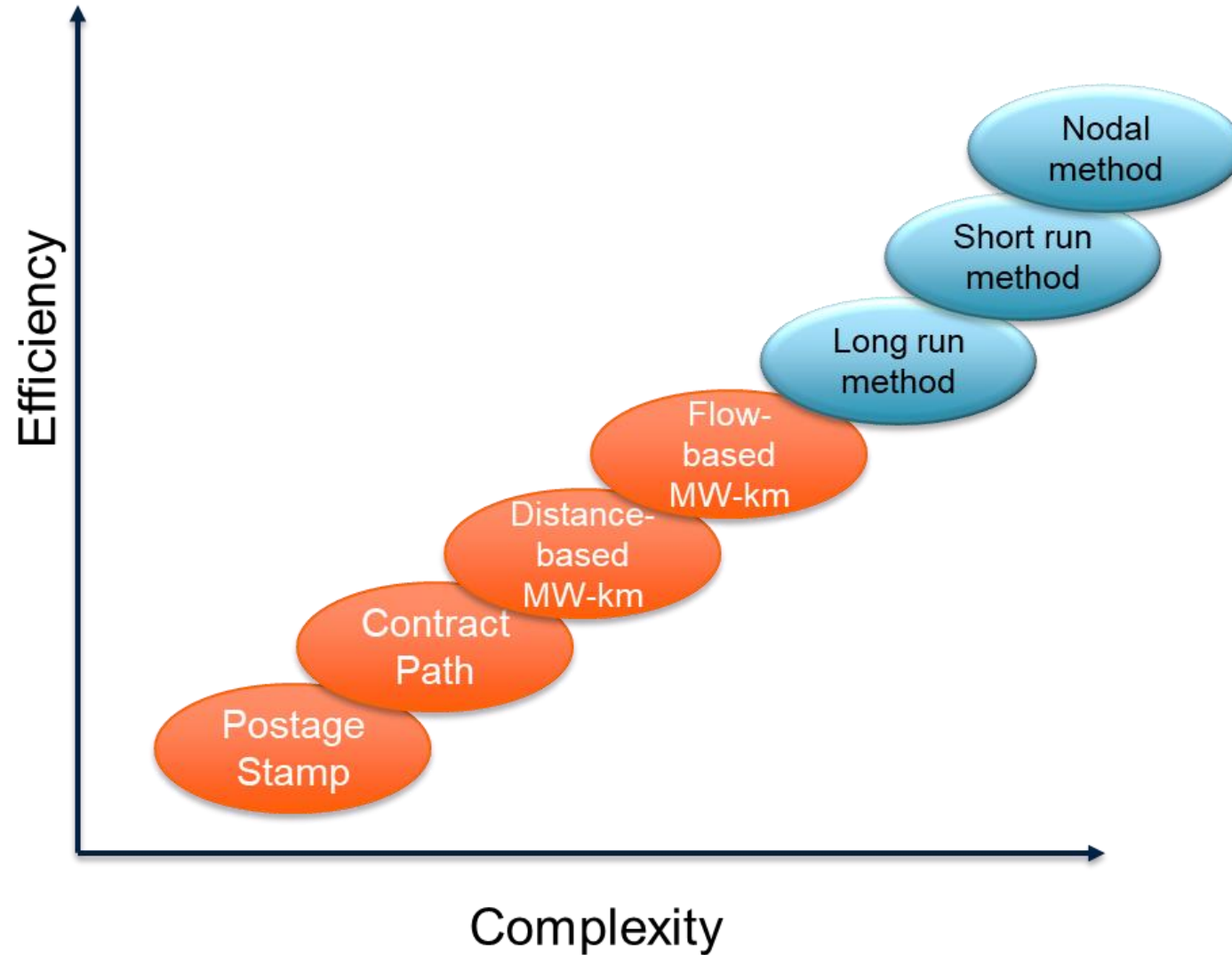
## Transaction-related services

- System Losses
- Congestion management
- Network and connection Studies

## TSO dispatch service (including ancillary services)

- System operation (Control Center, SCADA, etc.)
- Balancing/inadvertent flows
- Regulation and frequency response service
- Operating reserve service – spinning, primary, secondary, tertiary, etc.
- Voltage and reactive power
- Black start

# Types of Transmission Tariffs



# Tariff Setting Principles/Objectives

## Tariff Setting Process

### ARR

- Calculate Annual Required Revenue (ARR)

### Classification

- Classify the cost driver (energy, demand, customer)

### Allocation and Tariff Design

- Type of Customers
- Locational differences
- Time Dependency
- Type of Charges (capacity charge, energy charge)

# What Do Other Jurisdictions Do?

Jurisdiction	Postage Stamp	Contract path	Distance Based (MW-km)	Flow-based (MW-km)	Long Run Pricing	Short Run Pricing
UK (A)					✓	
Ireland	✓				✓	
Australia	✓			✓		
Brazil					✓	
New Zealand	✓					
ENTSO-E (B)	✓					
SAPP				✓		
WAPP				✓		

**A-** National Grid in United Kingdom calculates charges using a flow-based transport model but with unit costs of transmission built up using expansion costs based on LRMC principles. Charges are applied on a zonal basis.

**B-** In continental Europe, cross-border transmission charges are calculated from an assessment of the proportion of the energy supplied by each national network that arises from transits through the network arising from neighboring country transfers. A compensation sum is then agreed by the ENTSO-E members, which is allocated to the countries contributing to cross-border flows in proportion to their energy imports and exports.



# An Option for the Pan Arab Electricity Market (1/3)

The proposed transmission tariff methodology is representative only and meant to present one simplified option for the Pan-Arab ARC to design the PAEM transmission tariff approach as PAEM is initiated.

- Each PAEM country could develop a postage stamp tariff based on historical costs applied to cross-border traders (applying it domestically within the country is a national regulator decision, harmonization is preference of course).
- The tariff could be a single country-wide tariff for application at all delivery points on the international interconnections.
- The tariff could be a one-part tariff that collects all costs of transmission based on actual energy transported; e.g., US \$ per MWh.
- The tariff could recover the combined revenue requirement of all transmission service providers in the country. This cost would be divided by the total energy delivered by the Member State's transmission system to loads including the distribution companies, large customers directly connected to the transmission system and cross-border sales.
- The tariff would recover infrastructure costs including capex and opex, TSO costs and the average costs of providing system/ancillary services and losses on the domestic transmission system including international interconnections.

## An Option for the Pan Arab Electricity Market (2/3)

- The costs of **existing** cross-border transmission infrastructure would be recovered in the transmission tariff, as would the cost of new cross-border transmission infrastructure. However, cost recovery for **new** cross-border transmission infrastructure would be treated on a one-off basis as it would depend on the financing arrangements associated with each individual project.
- Traders would be charged according to the actual amount of energy delivered under their individual bilateral contracts by the third-party wheeling country.
- The tariff would not vary by time of use, location or transmission voltage supply level.
- The tariff would apply only to load—there would be no transmission charge for generators, although the parties to the bilateral contract can specify which party is responsible for paying transmission costs.
- At the end of the year, the tariff would be reset as necessary to reflect changes in transmission infrastructure costs and the amounts of energy delivered to all off-take points on the domestic transmission system.

# An Option for the Pan Arab Electricity Market (3/3)

## Treatment of congestion

- In cases where a country has high levels of congestion, recovery of costs to resolve congestion owing to both domestic and cross-border transactions should be included in the tariff, but the country should provide evidence that congestion management costs are material.
- Auctions should be held as necessary when demand exceeds available interconnection capacity although this is expected to be rare during the early stages of the PAEM. Costs associated with auctions, if necessary, would be paid by winning bidders according to the terms and conditions of the auction and their bids. These costs would be over-and-above costs associated with the transmission wheeling charge. As transmission utilization in the PAEM increases, a detailed auction design should be developed to ensure that transmission interconnection capacity continues to be allocated to the parties placing the highest value on the capacity.
- Revenues from the auctions should be used to reduce future transmission charges, be put toward future interconnection projects, or in the case of merchant facilities, paid to the merchant owner or the holder of the transmission rights.

# Thank You!