

To whom it may concern,

Thank you for the opportunity to respond to the consultation on the draft Power Market Regulations 2020. This response is submitted on behalf of AFRY Management Consulting, part of the AFRY consulting engineering company which is headquartered in Sweden.

Our submission is brief, focusing on a small number of issues.

I also attach a summary document summarising our own vision and some recommendations for the development of the Indian market. Our views have benefited from discussion with a number of stakeholders and the underlying paper was part of a project which was sponsored by IEX, but the views are our own beliefs and are not those of IEX or any other party.

I note that there is a public hearing on Friday 7th August: is there a way to connect remotely? Would AFRY have the opportunity to present the points below?

The successful development of the Indian power market over the past decade is a credit to the stewardship of the CERC. Faced with rapidly growing demand, the power system has delivered private investment, improved reliability, synchronous connection of the transmission systems, and a country-wide system of zonal pricing, with functioning spot markets trading from several days ahead to real time. The next decade will be equally transformational, as India builds a power system dominated by weather-dependent renewables and the need for flexibility. This future power system will place more emphasis on trading and less on long term contracts to deliver investment and efficient dispatch.

In this context, we expect that flexibility will come from new types of market participants, using decentralised resources and digital tools. We believe that the system will necessarily move away from central pricing and dispatch towards incentive-based decision-making. This in turn must be built on transparency of information and clarity of roles and responsibilities, most importantly that of balance responsibility. At the heart of such a system is the use of cost-reflective balancing energy (Deviation) prices, which will ultimately give all market participants incentives to support system balancing rather than placing a growing burden on the NLDC to manage small-scale resources. For market participants to manage their positions, it is important to have access to liquid, transparent markets; over a range of timeframes from forwards (supporting investment) to real-time (presently used for the security-constrained economic dispatch). This will include continuous intraday markets, to

permit adjustment at any time, and new bid structures and new market timeframes to support new types of market participant must be developed. Innovation by the market platforms is needed to bring about this future.

We have chosen to comment on the following aspects of the draft Power Market Regulations:

- Development of new markets and products
- Market coupling
- Optimal use of the transmission network
- Common clearing and settlement
- Scheduling and delivery (restrictions on trading by generators)

Development of new markets and products

The draft Regulation enables a number of new markets:

- Power exchanges are permitted to list forward contracts over 11 days in advance;
- Introduction of transparent over-the-counter platforms.
- Encouragement of new bid types in day-ahead and real time markets.

The regulations also clarify that the objectives of Power Exchanges include “(1) To design electricity contracts and facilitate transactions of such contracts”

We welcome the intent: the diversity of market players and their needs will increase, as the power system develops new decentralised sources of generation and flexibility.

However, we believe that the effect of market coupling (see below) will hamper the ability of the exchanges collectively to innovate, and will limit their incentives to do so. Instead of competing on their ability to define products which attract market participants, the exchanges must pool liquidity. Thus, exchanges cannot benefit from their own innovations but must instead share ideas with other exchanges.

We would recommend an environment in which exchanges and other market places (including brokers and OTC marketplaces) actively compete to meet the needs of market participants, rather than operating common systems.

Market Coupling

The draft Regulation proposes market coupling between exchanges for both day-ahead and real-time (hour ahead) markets, which echoes the experience of Europe. In this future, the Indian power exchanges will collate orders, but the algorithm for price discovery and ultimately the settlement will be conducted centrally. This will deliver a uniform price in each zone both at day-ahead and also at real-time (hour ahead) stages.

However, we note that in a multi-sequence market, the energy price for any zone and any delivery period will change as new information is known. Day ahead prices will differ from intraday and hour-ahead prices and should be free to do so: day-ahead in itself is not unique. Thus, uniform pricing in the day-ahead timeframe is desirable but not – in itself – necessary. Our experience in Europe is that the coupling between exchanges (Single Day-Ahead Coupling) has stifled innovation and our concern is that the coupling will not lead to optimal outcomes over time.

We believe that the emphasis in India should be to enhance the Deviation pricing arrangements, and to maximise freedom of market participants to trade between multiple marketplaces to perform price discovery and deliver efficient dispatch. In our view, the CERC should seek to maximise price transparency to allow prices to converge rather than enforcing price convergence through coupling.

Optimal use of the transmission network

The network capacity is allocated between marketplaces on a first-come-first-served basis. Thus, day-ahead takes precedence over intraday and the real time (hour-ahead) market. The effect of this will be to limit liquidity in the intraday market, which will have growing importance.

We would recommend a network capacity allocation methodology in which capacity is allocated to the marketplace and timeframe where it has most value, rather than first-come-first-served. Any existing corridor capacity rights may still be honoured, either physically or financially.

Common clearing and settlement

The draft Regulation includes provision for a common clearing and settlement function. This goes further than the European arrangements in which each exchange settles its own orders. The history of exchanges in Europe is that the (presumed) natural synergy between exchange and system operation has diminished, and greater synergies have been found between operators of spot markets and futures and forwards markets (for example EEX and EPEX Spot). As forward trading grows in importance, the potential for cross-commodity clearing

will grow. As market actors rely more on traded forward contracts and less on PPAs, collateral will become a topical issue, and the ability of the exchanges to compete in their clearing services could be an important differentiator.

Scheduling and delivery (restrictions on trading by generators)

The draft Regulation, and other documentation (e.g. guidelines for the Real Time (hour-ahead) Market) places restrictions that certain trades must be '*physically delivered, without netting*'. Although these terms are not defined, we infer them to mean that when a generator sells energy in the OTC, term-ahead or day-ahead market; then it may not subsequently trade out its position except in the case of Force Majeure: i.e. that generators are not free to buy and sell electricity in the spot markets.

If our understanding is correct, then this is a material barrier to trade, to liquidity and to effective price formation and efficient dispatch. The nature of an electricity market – especially in the face of renewable generation – is that expectations change as real time approaches. The buying and selling actions of generators in near-term markets are central to reaching efficient market outcomes. Only generators can know their true costs and parameters for dispatch, and if they are continually seeking opportunities to buy instead of producing to meet their contractual commitments, then market efficiency will result. If trades conducted several days in advance force a generator to produce energy irrespective of changes in market conditions, then it is clear that this will result in inefficient dispatch, an unwillingness of generators to trade ahead of time, or both. None of these is a desirable outcome and we would suggest that this should be reconsidered.

Closing words

The development of the Indian power sector is a global success story. We support and welcome the intentions of the CERC in preparing the market for the 2020s and the renewable power revolution. We offer our recommendations in a positive spirit, based on our own experience in Europe where the coupling between exchanges has not yet led to a vibrant intraday market. We look forward to the opportunity to discuss our ideas with the CERC in future.

About AFRY

AFRY is an international engineering, design and advisory company. We support our clients to progress in sustainability and digitalisation. We are 17,000 devoted experts within the fields of infrastructure, industry and energy, operating across the world to create sustainable solutions for future generations. AFRY has three offices in India, engaged in projects relating to build of renewable and pumped storage generation.

AFRY Management Consulting provides leading-edge consulting and advisory services covering the whole value chain in energy, forest and bio-based industries. Our energy practice is the leading provider of strategic, commercial, regulatory and policy advice to European energy markets. Our energy team of over 250 specialists offers unparalleled expertise in the rapidly changing energy markets across Europe, the Middle East, Asia, Africa and the Americas.

Thank you for consideration of the above points.

Stephen Woodhouse

Director

M: [+44 7970 572444](tel:+447970572444) | T: [+44 1865 812222](tel:+441865812222)

stephen.woodhouse@afry.com

AFRY Management Consulting
King Charles House
Park End Street
Oxford
OX1 1JD
United Kingdom
afry.com | [Linked In](#)

ÅF and Pöyry have come together as AFRY.
We don't care much about making history. We care about making future.

INDIA POWER MARKET REFORMS – A POINT OF VIEW

The transformation of the Indian power system has been hugely successful

The Indian power sector has been successfully transformed in the past decade. The grid areas have been connected to form the world’s largest synchronously connected system, and a robust nation-wide system of inter-zonal trading has been implemented. There has been a wave of investment in generation capacity, underpinned by long term PPAs, and the reliability of the power system for users has improved materially while serving rapid growth in demand (over 7% annually). While PPAs have been successful in bringing new privately-funded generation to the market, the next challenge is to integrate the PPA-contracted capacity to the spot markets to deliver efficient dispatch and price discovery.

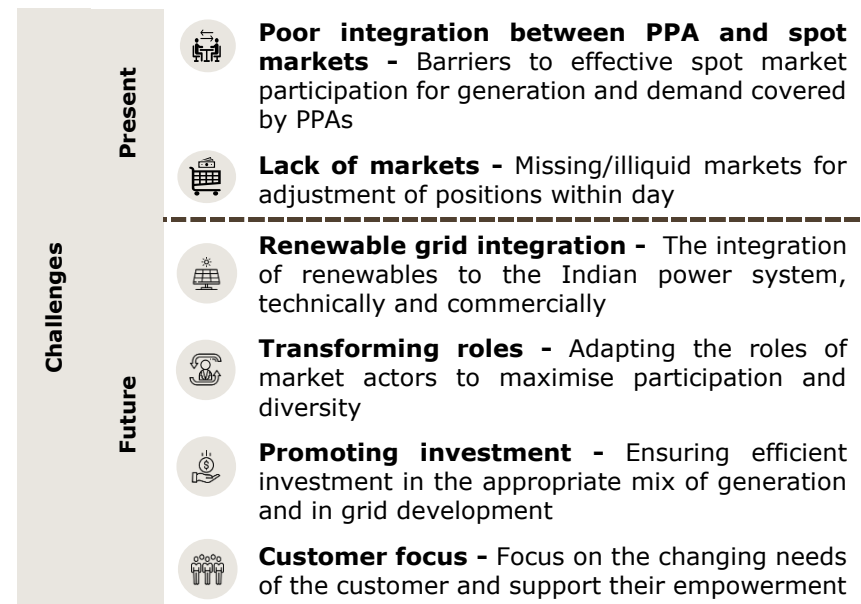
The next phase of the Indian power sector will be dominated by renewables

The next decade will see even more radical transformation as the system moves to dominance of variable renewable generation, in the context of continued demand growth and further investment in conventional capacity. India plans 175GW of renewables by 2022 (50% of capacity), and by 2030¹, anticipates a power system with 523GW of renewables, over 63% of future capacity. In that context, flexibility in trading and power system operation will come

to the fore, and it will be essential to bring to market a range of new resources to manage system volatility.

The Government of India’s vision for the 2024 power system is clearly defined in the Five Year Vision of 2019: “A sustainable, viable, efficient and competitive power sector catalysing economic and social development”.

Indian power market design must adapt to meet present and future challenges



¹ Source: Optimal generation capacity mix - CEA, 2019

Vision for Indian power market must embrace diversity, decentralisation and digitalisation

In the West, the paradigm is that customers' needs are predicted, and the industry invests and schedules capacity to meet these needs, almost without interruption. By contrast, a smart energy system is one in which the patterns of consumption adapt to the capabilities of the system, and in particular the availability of (weather-dependent) renewable generation.

The future Indian power system must embrace participation from a range of new actors including distributed generation and storage technologies as well as passive and active demand side management. Market players will choose between market timeframes according to their preference for risk and their own degrees of certainty and of flexibility. The bid structures, market formats and market timeframes must adapt to meet the needs of these new service providers. Parties will use the traded markets to adjust their position within-day, as weather forecasts change. In a sequence of market timeframes, there will be buyers and sellers of energy with different degrees of flexibility and the value of flexibility (and in investment in flexible capability) will emerge through market forces.

Our vision is consistent with that of the Government of India. The vision requires innovation and diversity in marketplaces and participation models, to maximise the system contribution of all available resources. India has the potential to leapfrog developed markets to move to a future energy system.

Competition between markets will deliver innovation and flexibility

In the present Indian context, regulations determine the type of products and the algorithms operated by power exchanges which currently compete in the same price areas offering the same products. These limitations – compounded by a lack of liquidity – stifle development of new marketplaces leading to a market design which will increasingly be ill-suited for a changing power mix.

Our vision for the future Indian power system harnesses competition between marketplaces and exchanges to deliver innovation, in terms of traded products, bid structures and trading formats and timeframes. This will lead to wider participation and deliver liquidity, price formation and efficient dispatch.

AFRY has experience in both centralised and decentralised energy market designs. In our view, a single centralised algorithm is unsuited to the level of diversity of generating resources or with the sheer number of dispatchable entities which will emerge in the Indian power system, and a more decentralised approach is more appropriate to deal with a smart energy system.

The proposed reforms are aimed at addressing immediate concerns

The proposed suite of reforms to the day-ahead, intraday and ancillary service arrangements are intended to resolve the immediate concerns relating to PPA integration to the

spot markets, the effectiveness of the spot markets and creating markets for close to real-time energy balancing.

In the main, we endorse the intentions and many of the detailed recommendations in the proposed reforms which seek to enhance operation of the spot markets and to deliver effective price formation and improved dispatch efficiency.

In addition, we present some recommendations which address the present and future challenges towards market design better suited for a highly renewable power system

On a high-level we have four key recommendations that differ from the proposed reforms in a number of aspects.

1. Building flexibility into current and future PPAs and sharpening incentives such that they support spot market participation and efficient dispatch
2. Enhancing liquidity and diversity of spot markets, with an emphasis on continuous intraday trading and including an economic allocation mechanism for transmission corridor capacity between market places and timeframes
3. Transforming roles of the TSO (POSOCO), exchanges and market participants to enable wider participation in a range of marketplaces
4. Enhancing SCED to deliver real time energy prices, deviation energy prices and (ultimately) ancillary services

Conclusions

- As the Indian power sector develops, the share of renewable generation will grow and more small-scale resources with different characteristics will enter the market.
- As emphasis grows on different forms of flexibility; the arrangements which force participants to trade in particular markets or in particular timeframes will become inefficient and ineffective.
- The real time market should be coupled to deliver a single price for each zone (and for ancillary services).
- Centralised market designs ahead of real-time markets are increasingly unfit for purpose: future arrangements need to offer freedom to trade a range of products over a various markets and timeframes to accommodate the diversity of resources and needs.
- The value of having multiple exchanges is to incentivise innovation, and this should be encouraged not stifled as the power system develops. Forcing a single algorithm or common bid structure will damage incentives.
- Traders can operate between markets for price discovery including the value of flexibility as real time approaches.
- The role of TSOs in developed markets is shrinking. Self-dispatch must move ever closer to real time, settlement intervals should shorten, and emphasis should be on 'incentives' not 'control'.

CONTACT DETAILS



Stephen Woodhouse
Stephen.Woodhouse@afry.com



Shweta Jadhav
Shweta.Jadhav@afry.com

ABOUT US

ÅF and Pöyry have come together as AFRY. AFRY is an international engineering, design and advisory company. We support our clients to progress in sustainability and digitalisation. We are 17,000 devoted experts within the fields of infrastructure, industry and energy, operating across the world to create sustainable solutions for future generations.

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AFRY Management Consulting is a key advisor for design and adaptation of power markets globally. AFRY has been commissioned by the Indian Energy Exchange (IEX) to assess the power market reforms proposed by the Central Electricity Regulatory Commission (CERC), with a focus on the day-ahead market arrangements through a centralised marketplace driven by a centralised algorithm and dispatch. We have reviewed the three key proposals to market reforms (i.e. day-ahead market, real-time markets and ancillary service markets) in the broader context of challenges in the Indian power market, and made outline recommendations. These provide a pathway to market reform which meets the objectives of the CERC while focusing on the diversity and innovation which will be necessary for the future Indian power system.

The work has been funded by IEX; but has also benefited from dialogue with a range of stakeholders and advisors active in the Indian power market. We take pride in providing an independent view. The views expressed in this report are AFRY's own and the conclusions are not necessarily endorsed by IEX, the project sponsor, in whole or in part.

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ANNEX



CHAPTER 7 – RECOMMENDATIONS

Recommendations to address PPA integration barriers to market participation



POOR INTEGRATION BETWEEN PPA AND SPOT MARKETS

Barriers to effective spot market participation for generation and demand covered by PPAs

Recommendation	Specifics	Issues addressed
<p>PPA1: Build flexibility into existing PPAs to maximise market participation and sharpen incentives</p>	<ul style="list-style-type: none"> • Retain physical nature of PPA for energy • Allow generators to participate in spot markets for make-or-buy to determine their own physical production • Propose spot economic purchase obligations on Discoms which require them to test PPA variable costs against the spot markets • Require Discoms to open discussion with PPA generators, with the aim of reaching mutual agreement on revised terms to deliver market participation which maximise added value, including URS treatment <ul style="list-style-type: none"> • offer backstop of a neutral arbitrator • if termination date is undefined, no presumption that contracts will be rolled over indefinitely • Incorporate PPA transmission corridor rights into scheduling and settlement process, potentially as financial transmission rights (congestion income) 	<ul style="list-style-type: none"> • Liquidity • Price discovery including intraday • Capture of URS • Uneconomic dispatch • Sub-optimal use of network capacity <p>Other considerations</p> <ul style="list-style-type: none"> • Avoid forced PPA contractual changes: incentives not obligations • Voluntary negotiation permits sharing to reflect the appropriate balance of cost, risk and reward • Incentivises generators to trade in the most appropriate market timeframes for their needs

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to address lack of markets (1)



LACK OF MARKETS
Missing/illiquid markets for adjustment of positions within day

Recommendation	Specifics	Issues addressed
<p>MM1: Introduce hour-ahead ('real time') markets mainly in line with CERC's recommendations</p>	<ul style="list-style-type: none"> • Introduce hour-ahead auction markets with short gate closure and short dispatch interval as in CERC recommendation • Emphasis should be on simple products and fast auction run time • Coupling between exchanges is not required 	<ul style="list-style-type: none"> • Improves opportunity for participants to actively balance their positions with 15 minute resolution
<p>MM2: Support liquidity in day-ahead and intraday marketplaces</p>	<ul style="list-style-type: none"> • Support ongoing upward trend in intraday liquidity, further boosted by improvements to pricing of Deviation energy and measures to support PPA flexibility • No mandatory participation in day-ahead (which would damage intraday liquidity) • Remove transaction-based pancaking of transmission charges • Consider a transitional market-making (paid) support for DAM and intraday liquidity 	<ul style="list-style-type: none"> • Liquidity • Price discovery including intraday • Uneconomic dispatch

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to address lack of markets (2)



LACK OF MARKETS

Missing/illiquid markets for adjustment of positions within day

Recommendation	Specifics	Issues addressed
MM3: SCED to become a national balancing market, used to determine real time marginal residual energy prices (and ancillary service prices, see overleaf)	<ul style="list-style-type: none"> Extend participation of SCED to include all generators and demand side participation Stage 1: Define SCED as a residual balancing market with ex-post marginal energy pricing Extend scope of SCED to cover non-energy actions as well as energy actions Stage 2: Use SCED to determine prices in each price area for settlement of Deviation energy at regional and state level Other recommendations: <ul style="list-style-type: none"> Consider causer-pays for recovery of cost of ancillary services (generation and load) 	<ul style="list-style-type: none"> Provides an effective real-time energy price against which Deviation energy may be settled Improves incentives for participants to balance Provides transparency on costs of non-energy actions
MM4: SCED to co-optimize energy and ancillary services (beginning with Tertiary Reserves, later extension to include secondary control and fast tertiary)	<ul style="list-style-type: none"> Follow CERC recommendations to formalise commercial arrangements for ancillary services in terms of product definitions, probabilistic methodology, market based payments, wider participation, buy-back Stage 3: extend scope of SCED to include co-optimisation with ancillary services Other recommendations: <ul style="list-style-type: none"> Apply ex-ante allocation of transmission corridor capacity to ancillary service needs on an economic basis Consider causer-pays regime for ancillary services (for generation as well as demand) 	<ul style="list-style-type: none"> Pays economic market value for ancillary services in order to reward flexibility Ancillary service provision is included in real time scheduling Applies appropriate incentives for causing ancillary service requirements

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to address lack of markets (3)



LACK OF MARKETS
Missing/illiquid markets
for adjustment of
positions within day

Recommendation	Specifics	Issues addressed
<p>MM5: Facilitate POSOCO procurement of ancillary services in DAM and intraday markets</p>	<ul style="list-style-type: none"> Facilitate advance procurement of <u>some</u> AS quantities in DAM and/or Intraday markets, whether by co-optimisation or other means Later, permit AS contractors to bilaterally re-trade AS obligations within day 	<ul style="list-style-type: none"> Permits purchase of ancillary services as required in earlier market timeframes Ancillary service requirements are factored into scheduling decisions as real time approaches Exchanges may choose to list ancillary service products in their markets

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to address renewable grid integration (1)



RENEWABLE GRID INTEGRATION

The integration of renewables to the Indian power system, technically and commercially

Recommendation	Specifics	Issues addressed
RGI1: Improve balancing incentives and opportunities	<ul style="list-style-type: none"> • As TR1: SCED to become a national balancing market, used to determine real time residual energy prices • As MM1: Introduce hour-ahead ('real time') markets (without exchange-coupling) • As MM2: Support liquidity in all day-ahead and intraday marketplaces without mandatory trading in any timeframe 	<ul style="list-style-type: none"> • Liquidity • Price discovery including intraday • Uneconomic dispatch <p>Other issues addressed</p> <ul style="list-style-type: none"> • Inappropriate use of Deviation • Liquid continuous markets give enhanced incentives and opportunities for re-balancing immediately, as changes arise
RGI2: Reward flexibility in intraday and real-time markets	<ul style="list-style-type: none"> • Support development of pricing in continuous intraday markets, allowing participants to trade freely between markets and exchanges 	<ul style="list-style-type: none"> • Ensure that the value for flexibility within-day is revealed

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Recommendations to address renewable grid integration (2)



RENEWABLE GRID INTEGRATION

The integration of renewables to the Indian power system, technically and commercially

Recommendation	Specifics	Issues addressed
RG13: Economic network capacity allocation methodology for effective use of networks	<ul style="list-style-type: none"> • POSOCO to introduce an economic network capacity allocation methodology (ENCAM) to allot transmission corridor capacity between <u>all</u> marketplaces, traded products and timeframes <u>on an economic basis</u> (not first-come-first-served) • To include SCED and ancillary service requirements as well as intraday, day-ahead and real time markets (and new markets in future) • Rights of PPA holders can be respected through defined use-it-or-sell it physical or financial transmission rights 	<ul style="list-style-type: none"> • Uneconomic dispatch • Sub-optimal use of network capacity Other considerations <ul style="list-style-type: none"> • Existing PPA transmission rights must be respected (financially) but should not constrain efficient dispatch
RG14: Shared resources: market arrangements which effectively share resources between different contracts, different locations and different buyers	As PPA1 : <ul style="list-style-type: none"> • Build flexibility into existing PPAs As RG13 : <ul style="list-style-type: none"> • Economic network capacity allocation methodology for effective use of networks 	Other considerations <ul style="list-style-type: none"> • Current network capacity is designed to prioritise long-term PPAs • Discoms are obliged to schedule the capacity from contracted plants first

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to address renewable grid integration (3)



RENEWABLE GRID INTEGRATION

The integration of renewables to the Indian power system, technically and commercially

Recommendation	Specifics	Issues addressed
RG15: System support: appropriate payments and product definitions for system (ancillary) services, to attract flexibility from service providers	<ul style="list-style-type: none"> As MM4: SCED to co-optimize energy and ancillary services As MM5: Facilitate POSOCO procurement of ancillary services in DAM and intraday markets 	<ul style="list-style-type: none"> Value for flexibility is essential to incentivise development of flexible resources which in turn allow renewables to be accommodated in the market <u>technically</u> (with limited curtailment)
RG16: New providers: new technologies will be needed for flexibility including flexible hydro, pumped storage and grid scale batteries	<ul style="list-style-type: none"> As TR1: Incentivise PX operators to compete and innovate to deliver appropriate products and market formats for new technologies As CF3 below: Maximise spot market participation from non-conventional service providers Ensure that spot and real time prices and ancillary services reflect full economic value 	<ul style="list-style-type: none"> Value for flexibility is essential to incentivise development of flexible resources which in turn allow renewables to be accommodated in the market <u>commercially</u> (with limited revenue cannibalisation)

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to transform roles (1)



TRANSFORMING ROLES

Adapting the roles of market actors to maximise participation and diversity

Recommendation	Specifics	Issues addressed
<p>TR1: Incentivise power exchanges and other market enablers (brokers, clearing houses) to innovate and compete for market share and liquidity</p>	<ul style="list-style-type: none"> • Encourage PXs to innovate in products and timeframes to maximise participation and liquidity • Exchanges should be free to create new bid structures and market timeframes without CERC's prior approval • This will allow exchanges to adapt their services to meet the needs of new technologies and service providers • If new marketplaces are to be given access to the economic network capacity allocation process then greater regulatory scrutiny is required • Ahead of RTM, do not require coupling between exchanges • Deregulate bid formats in DA and intraday 	<ul style="list-style-type: none"> • Liquidity • Price discovery including intraday • Limited market participation • Meeting the needs of renewable generators and future providers of flexibility: existing timeframes and bid formats may not be suitable • Allow competition not regulation to deliver market adaptation: reduce regulatory risk <p>Other considerations</p> <ul style="list-style-type: none"> • Removing regulatory process around bid formats gives first-mover incentives for PXs to innovate • Conversely, coupling between exchanges would stifle innovation and competition ahead of the RTM
<p>TR2: Market participants to trade between marketplaces in order to deliver price discovery: encourage participants to trade freely between market prices</p>	<ul style="list-style-type: none"> • Do not require mandatory participation in any particular market timeframe (beyond information sharing) • Enable a range of market places within day without interruption, to permit adjustment of traded positions and real-time revelation of the market value 	<ul style="list-style-type: none"> • Liquidity • Price discovery including intraday • Uneconomic dispatch <p>Other considerations</p> <ul style="list-style-type: none"> • Avoid suboptimal outcomes arising from forcing participants to trade in a particular timeframe which may not match their needs

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to transform roles (2)



TRANSFORMING ROLES

Adapting the roles of market actors to maximise participation and diversity

Recommendation	Specifics	Issues addressed
TR3: POSOCO to support information sharing and transparency	<ul style="list-style-type: none"> • POSOCO to coordinate information sharing on demand and RES forecasts and generator availability and outage information 	<ul style="list-style-type: none"> • Price discovery • Uneconomic dispatch <p>Other considerations</p> <ul style="list-style-type: none"> • Transparency mitigates market power • Transparency gives confidence to market entrants
TR4: POSOCO to procure ancillary services from demand side providers	<ul style="list-style-type: none"> • Incentivise POSOCO to actively procure resources from demand side participants where technically and economically viable • POSOCO to adapt qualification criteria for relevant services to accept aggregated resources and new technologies 	<ul style="list-style-type: none"> • Price discovery • Uneconomic dispatch <p>Other considerations</p> <ul style="list-style-type: none"> • Demand side participation mitigates market power
TR5: POSOCO to coordinate process for transmission corridor capacity allocation between marketplaces and products based on economic value	<ul style="list-style-type: none"> • as RGI3: Economic network capacity allocation methodology for effective use of networks 	<ul style="list-style-type: none"> • Uneconomic dispatch • Sub-optimal use of network capacity <p>Other considerations</p> <ul style="list-style-type: none"> • Existing PPA transmission rights must be respected (financially) but should not constrain efficient dispatch

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to promote investment (1)



PROMOTING INVESTMENT

Ensuring efficient investment in the appropriate mix of generation and grid development

Recommendation	Specifics	Issues addressed
PM1: Build flexibility into future PPA design to maximise market participation and sharpen incentives	<ul style="list-style-type: none"> Design future contracts around incentives to participate in in a range of spot markets (not just one timeframe) for generators to determine their own physical production For future PPAs, define day-ahead as last call time by the buyers to decide whether or not to buy Incorporate future PPA transmission corridor rights into scheduling and settlement process, potentially in the form of financial transmission rights (congestion income) Build in future flexibility to mutually agree added value as markets change Shorter (15 year) term for future contracts without automatic renewal rights 	<ul style="list-style-type: none"> Ensure that the next wave of PPAs are consistent with effective spot market participation Ensure any net revenue sharing accounts for risk (not 50/50: follow structure of Section 63 contracts)
PM2: SCED to co-optimize energy and ancillary services to deliver market value	<ul style="list-style-type: none"> As MM4: SCED to co-optimize energy and ancillary services As MM5: Facilitate POSOCO procurement of ancillary services in DAM and intraday markets 	<ul style="list-style-type: none"> Investment incentives must relate to the nature as well as the quantity of capacity Investment should include plant improvement as well as new build

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to promote investment (2)



PROMOTING INVESTMENT

Ensuring efficient investment in the appropriate mix of generation and grid development

Recommendation	Specifics	Issues addressed
<p>PM3: Long run regulatory guideline: Review RTM SCED price formation to ensure there are no barriers to spot prices being adequate to cover full long run marginal cost over time</p>	<ul style="list-style-type: none"> • RTM (and spot) prices should not systematically embed missing money: instead they should permit pricing of scarcity if it occurs • Consider applying scarcity price function (e.g. Operating Reserve Demand Curve) in Deviation pricing 	<ul style="list-style-type: none"> • Permits market entry without the backing of a long term PPA in particular for renewable capacity • PPA and forward contract buyers are protected from spot price rises • Avoids the need for separate regulatory mechanisms to reward capacity, adequacy etc. • Active and passive demand response captures its full economic value without side payments

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CHAPTER 7 – RECOMMENDATIONS

Recommendations to address customer focus



CUSTOMER FOCUS

Focus on the changing needs of the customer and support their empowerment

Recommendation	Specifics	Issues addressed
CF1: Seek active demand side participation	<ul style="list-style-type: none"> • Incentivise POSOCO to actively procure resources from demand side participants where technically and economically viable • POSOCO to adapt qualification criteria for relevant services to accept aggregated resources and new technologies • Introduce opportunities for demand side aggregators to participate in the markets • As MM3: SCED to become a national balancing market, used to determine real time marginal residual energy prices 	<ul style="list-style-type: none"> • Inefficient dispatch • Market power
CF2: Enable passive demand side participation	<ul style="list-style-type: none"> • Enhance transparency and liquidity of market prices • Cost-reflectivity in network and other charges 	
CF3: Maximise spot market participation from non-conventional service providers	<ul style="list-style-type: none"> • As CF1: seek active demand side participation • As TR1: Incentivise power exchanges and other market enablers (brokers, clearing houses) to innovate • As RGI2: Reward flexibility 	<ul style="list-style-type: none"> • Appropriate investment incentives • Reducing curtailment and revenue cannibalisation for RES

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