

# THERE'S TIME TO BUILD A STRONGER, CLEANER POWER SYSTEM... IF WE START NOW

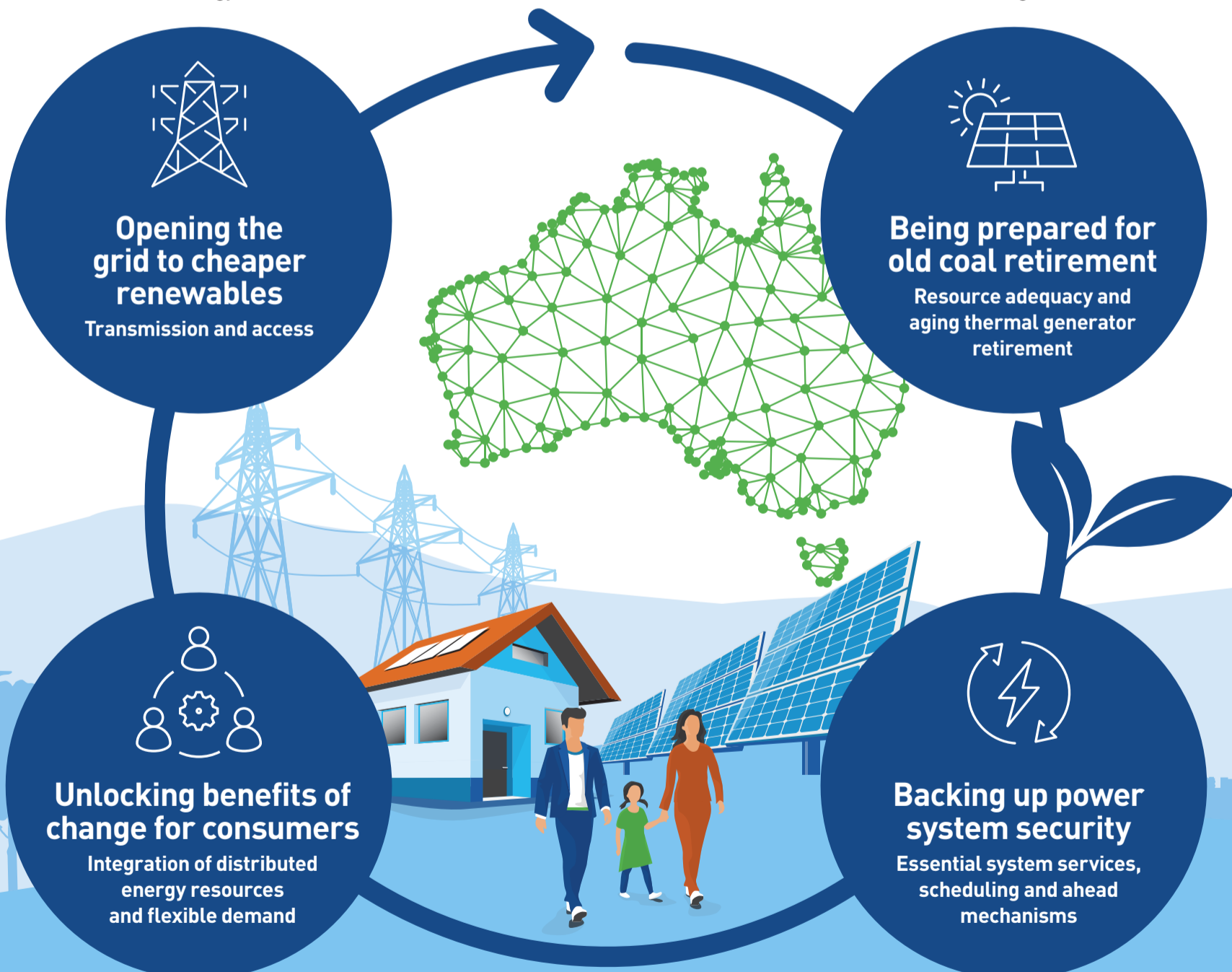
Renewables penetration in Australia is massive and leading the world. Large-scale wind and solar, along with rooftop PV, is spreading so fast the power system is reaching its technical limits. Great opportunities lie ahead. We just need the right consumer protections along with strong, deliberate policy to connect new generation securely, and keep the lights on at the lowest cost possible.

We report back to energy ministers in mid-2021 with final recommendations for a redesigned electricity market.

Have your say: 

Getting new generation onto the grid is vital to enable orderly exit of coal-fired power. Wind and solar is being built so fast, in so many places, that networks are overloaded, slowing down the grid and stopping new energy technologies reaching consumers. We have already introduced whole of system transmission planning (AEMO's actionable integrated system plan). We propose new ways to bridge the gap between immediate work being done to implement renewable energy zones that can provide for easier connection of new generation and, then, in the medium term, make arrangements to manage network congestion between renewable energy zones and customers.

Australia will replace most of its generation by 2040. This rollover is being accelerated by government investment schemes. Cheaper renewables are coming to market faster, cutting spot and contract prices and driving less economic generation (mainly coal powered) to close. We propose new ways to manage early exits, and drive investment in new resources including modifications of the retailer reliability obligation which requires retailers to buy advance contracts to fill supply gaps, a possible new operating reserve and long-term transition cost monitoring.



Along with supply-side variability linked to weather dependent generation there's rising variability on the demand side with uptake of rooftop solar, batteries and smart appliances. Looking ahead we'll see all sorts of services rewarding people for changing demand patterns or contributing to innovations like community batteries. We propose consideration of consumer protections to keep pace with change, and solutions for local congestion/stability issues so more home-made solar power can help lower system costs for everyone.

All day, every day the system must balance electricity supply and demand to keep the lights on. That's harder to do when more generation is weather driven, especially when the aging coal fleet is less dependable. Security can no longer be taken for granted. We propose a new framework to secure essential services like frequency and voltage control and inertia, and developing new procurement mechanisms to keep the technical characteristics of the power system within safe limits.

## BEING PREPARED FOR OLD COAL RETIREMENT

### Resource adequacy and aging thermal generator retirement

Decarbonisation of Australia's economy is well underway and accelerating. Governments are focused on lowering emissions in big emitting sectors like electricity, transport, and agriculture. The rise of cheaper renewables is making a real difference - changing the economics of old, coal plant which is closing early. Increasingly we will see sectors like manufacturing have to prove they are using green power if they want to export. We must get this sorted.

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Have your say: [▶](#)

## PROPOSAL FOR REFORM PATHWAY

### IMMEDIATE



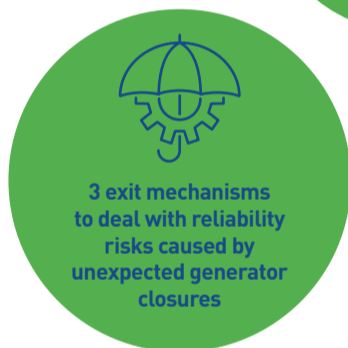
#### IMPACT

To provide jurisdictions with more information on electricity resource needs and timing so their schemes can integrate with the contract market.



#### IMPACT

To encourage investment in generation projects and sharpen wholesale price signals to the market.



#### IMPACT

1. Extra information on seasonal shutdowns and mothballing.
2. Expanding notice of closure requirements to include mothballing.
3. New System and Market Impact Assessment to allow timely state government intervention if closure risks are too great.

### INITIAL



#### IMPACT

To help promote commercial investment, to reduce the risk of unexpected generator closures, increase liquidity in contract market.



#### IMPACT

Additional demand for dispatchable power through an operating reserve could help smooth out short-term changes in supply and demand and trigger more investment.

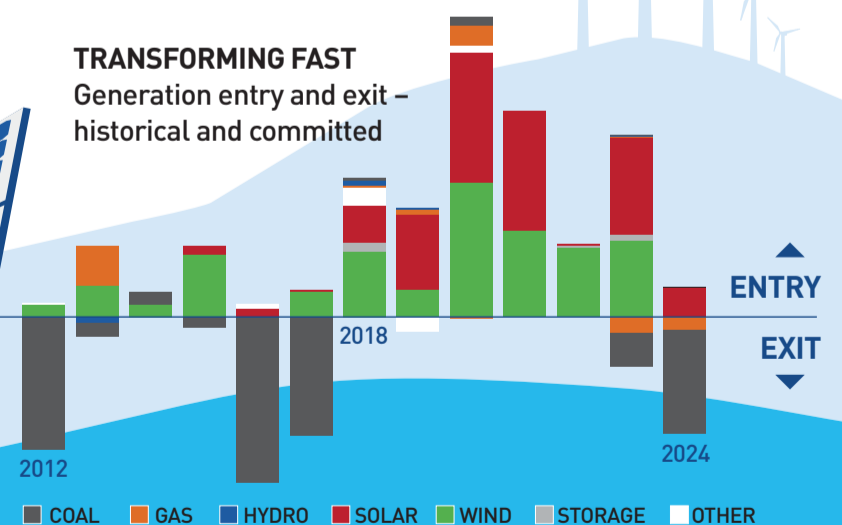
### NEXT



#### IMPACT

To be undertaken by market bodies following implementation of the ESB's post 2025 reforms.

### TRANSFORMING FAST Generation entry and exit – historical and committed



We want essential electricity to keep flowing to all. This requires orderly entry of decentralised, mostly renewable generation and planned exit of old, mostly coal plant, so investors can develop new resources with confidence and governments can support the sector in the most appropriate, low-cost ways.

**Reliability** = is having enough generation when we need it, enough demand side response and enough major transmission to supply consumers' needs

# BACKING UP POWER SYSTEM SECURITY

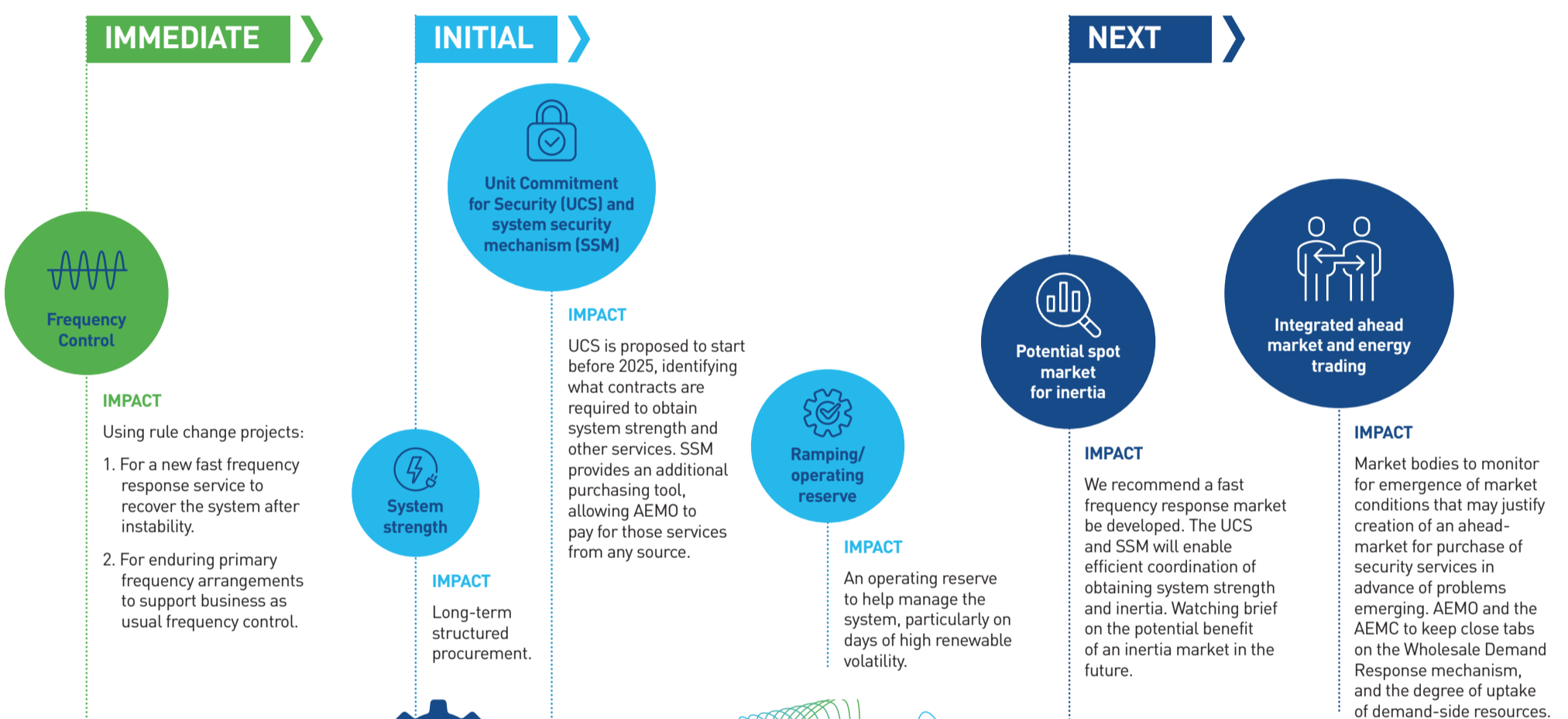
## Essential system services, scheduling and ahead mechanisms

We are at the cutting edge of managing a power system with high levels of variable generation including large and small-scale wind and solar. Almost 3 million homes have solar panels, the highest take-up in the world. But while our generation mix is changing, the physics of our power system will not. Technical stability services like inertia, frequency control, system strength and operating reserves are not automatically provided by renewables. This requires us to fix the crucial security challenges that come with new technologies.

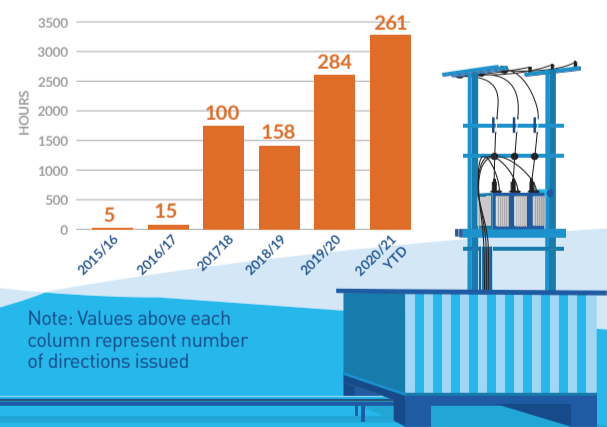
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## PROPOSAL FOR REFORM PATHWAY



**STEPPING IN TO KEEP THE LIGHTS ON**  
Number of AEMO directions and duration, 2015-20



We want new regulatory frameworks to be implemented as soon as possible to make the power system stronger. Introducing mechanisms to purchase core system services in the new-look market will build consumer confidence that a stable and dependable power supply can be maintained as we head towards instantaneous, variable renewable penetration of 75% in 2025.

**Security** = all about the power system's ability to keep technical parameters; voltage, frequency, current flows; within safe limits and control.

# UNLOCKING BENEFITS OF CHANGE FOR CONSUMERS

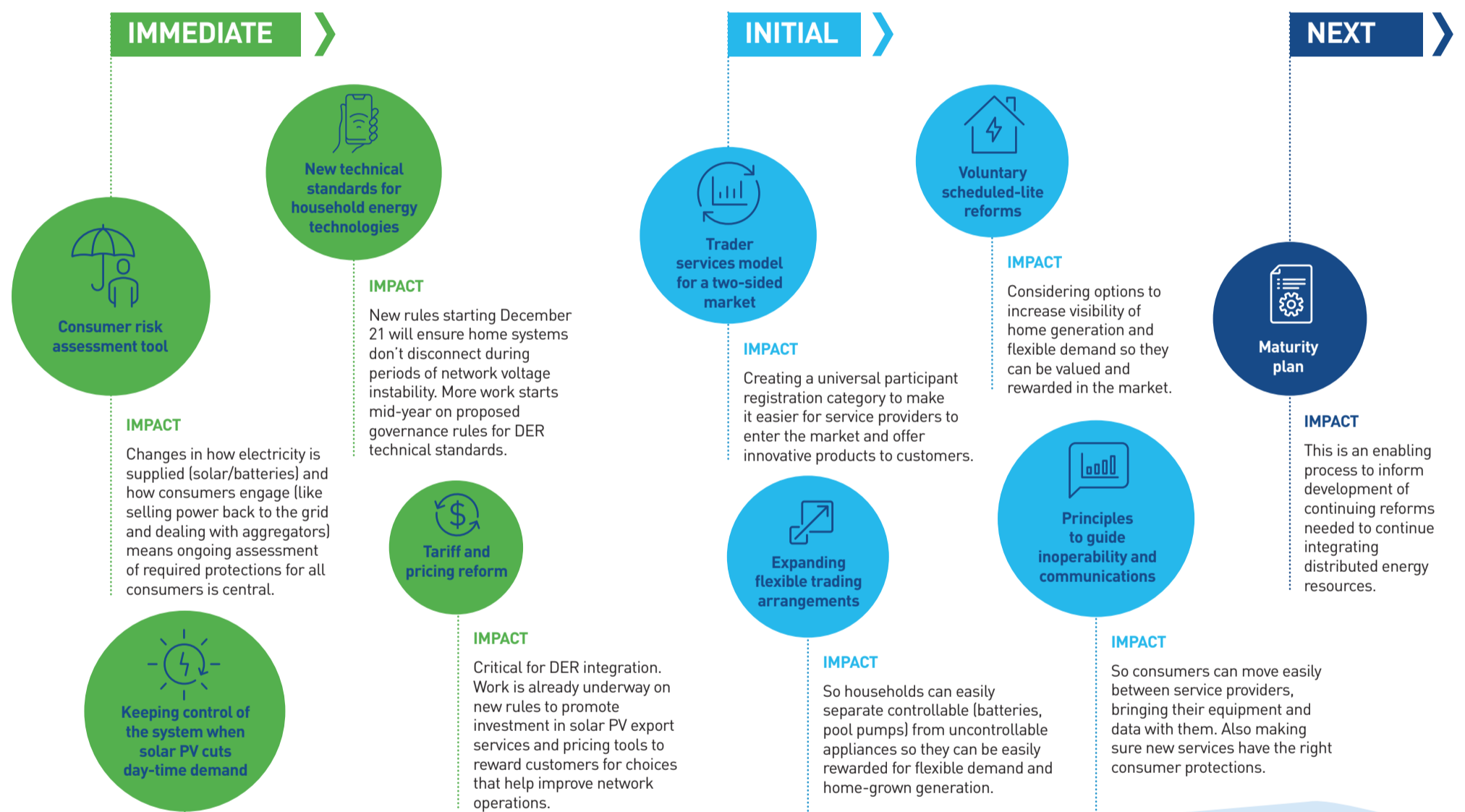
## Integration of distributed energy resources and flexible demand

Consumers have led the decentralisation charge by enthusiastically embracing solar PV, batteries and smart appliances to manage demand and cut bills by selling “home-made” power to the grid. But the system and networks were set up for the old world - just to get power to homes, and not back the other way as well. Two-way flows are here and problems are emerging. We need to fix them so everyone can make the most of new energy technologies and allow renewables to lower overall system costs.

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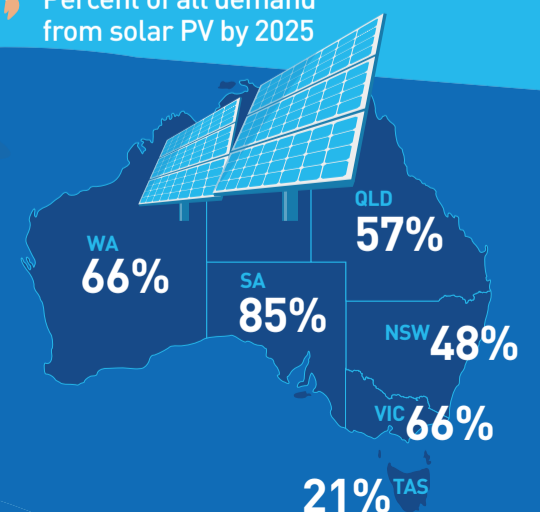
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## PROPOSAL FOR REFORM PATHWAY



**20%** of electricity customers already sell excess electricity back to the grid

**HERE COMES THE SUN**  
Percent of all demand from solar PV by 2025



In the new electricity market consumers should be able to get energy services they value at a price they want. Much like a mobile phone plan, people want to pick services knowing their consumer rights are protected. They won't need to see the back engine that will make it possible to have cheaper energy – it will be done for them. For owners of distributed energy resources, efficient integration would provide opportunities to maximise returns on their investment. This could range from using their exported electricity to reduce their bills, to accessing and participating in the growing number of new energy services markets – or a combination of both. Efficient integration could also significantly benefit non-owners through lower total system costs.

# OPENING THE GRID TO CHEAPER RENEWABLES

## Transmission and access

Large-scale renewables are coming online fast, and transmission networks are struggling to catch up. Our richest wind and solar energy resources are spread far and wide across often remote locations, leading to connection issues, delays and congestion on the grid. We need to put our generation and transmission together in ways that minimise costs so we can continue to get energy to where people need it.

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## PROPOSAL FOR REFORM PATHWAY

### IMMEDIATE

**New transmission investment**

**IMPACT**

Large-scale renewables are widespread across windy/sunny locations. Building transmission in strategic locations as recommended by AEMO's Integrated Systems Plan is important to get generators on the grid. The AEMC will review the adequacy of frameworks for timely and efficient delivery of big transmission projects.

**Actionable Integrated System Plan rules for transmission**

**IMPACT**

Have introduced whole of system planning framework which provides information on generation and transmission options required to meet system needs over 20 years.

**System strength investigation**

**IMPACT**

Our REZ framework will integrate AEMC recommendations on a network planning standard for higher levels of system strength and new technical standards for generator grid access.

**New rules on dedicated connections assets**

**IMPACT**

New rules are being developed to encourage transmission investment by allowing generators to fund shared assets.

**Interim Renewable Energy Zone (REZ) framework for confident long-term investments**

**IMPACT**

We are working with state governments on implementation roadmaps for priority REZs which provide access solutions that apply to specific locations. A separate paper on aspects of this work will be submitted to energy ministers soon.

**Enhanced congestion information**

**IMPACT**

We want to hear your views on the usefulness of longer-term forecasts including a two year or 10-20 year congestion forecasting framework.

### INITIAL

**Medium term access reform options**

**IMPACT**

Will be necessary before a long-term shift to locational marginal pricing and financial transmission rights. Medium term options include facilitating establishment of priority renewable energy zones (REZs) with a consistent framework to promote investment, and allow generators to fund shared assets.

### NEXT

**New system of locational marginal pricing**

**IMPACT**

Pays generators for the actual value of supplying electricity from where they are physically located. This turns the currently blunt pricing instrument into a much more precise one that would see wholesale prices drop when there is congestion and return to the value of a regional reference price when congestion is alleviated.

**New risk management tool - financial transmission rights**

**IMPACT**

Allows generators to hedge for drops in revenue when local prices are lower. Helps lower the costs of capital, puts more certainty around earning levels and supports more efficient generator investment decisions.

### Access gap

Getting more renewable energy to market as decarbonisation gathers speed

New wind & solar projects current at Jan 2021

ISP new REZ hosting capacity to 2029-2030

0 5000 10000 15000 20000 25000 30000 35000 40000 MW

**CONSUMER BENEFIT**

This reform is key to help drive consumer costs down. Congestion is emerging across the transmission network preventing the cheapest, greenest combination of energy reaching the market. We want to pay generators the actual value of supplying electricity from the location they're in. This would give new, mainly renewable generators, financial incentives to locate and dispatch in the most efficient parts of the grid – and help more green power get to consumers.