



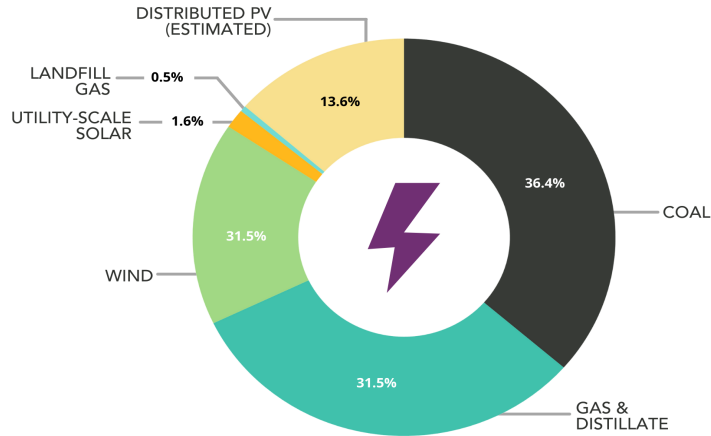
# Towards Net Zero

Australian Energy Transition  
ISGT Asia 2022 - Singapore

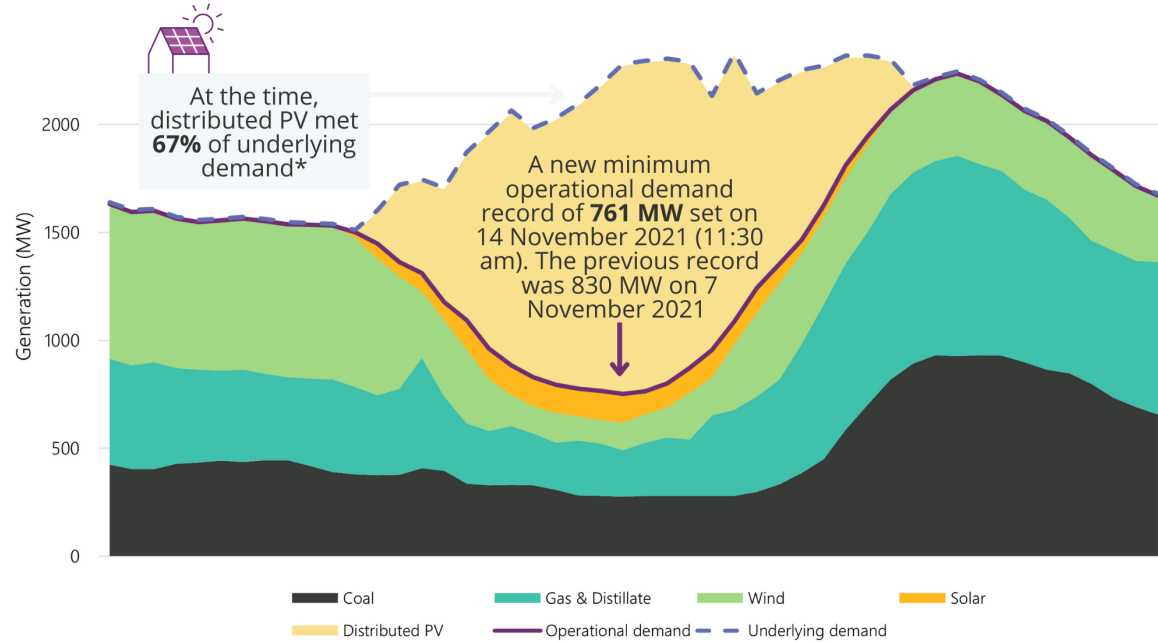
Dean Sharafi

# Growth in renewable generation continues

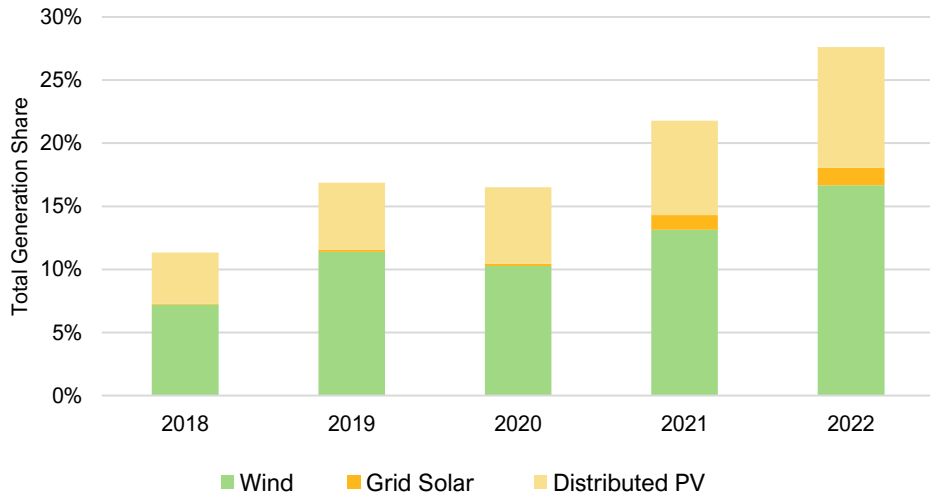
## Average generation by fuel source – FY22



## Renewables driving record low electricity from the grid



## Renewable Generation Share – Quarter 2



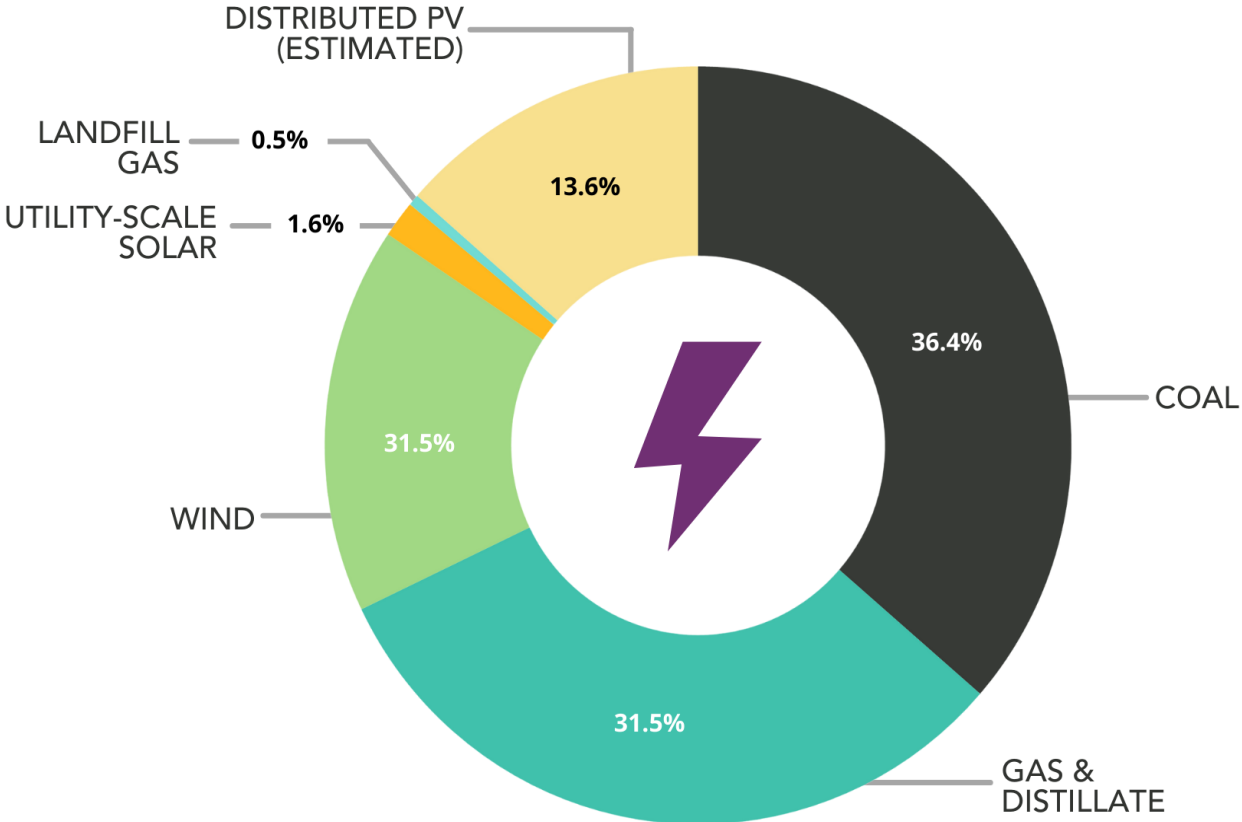
In Q2 2022 renewable generation, including distributed PV, supplied **28%** of total underlying demand in the WEM, driven by increasing wind and Distributed PV capacity.

The all time record for a single 30minute interval was **79%** (7 September 2021).



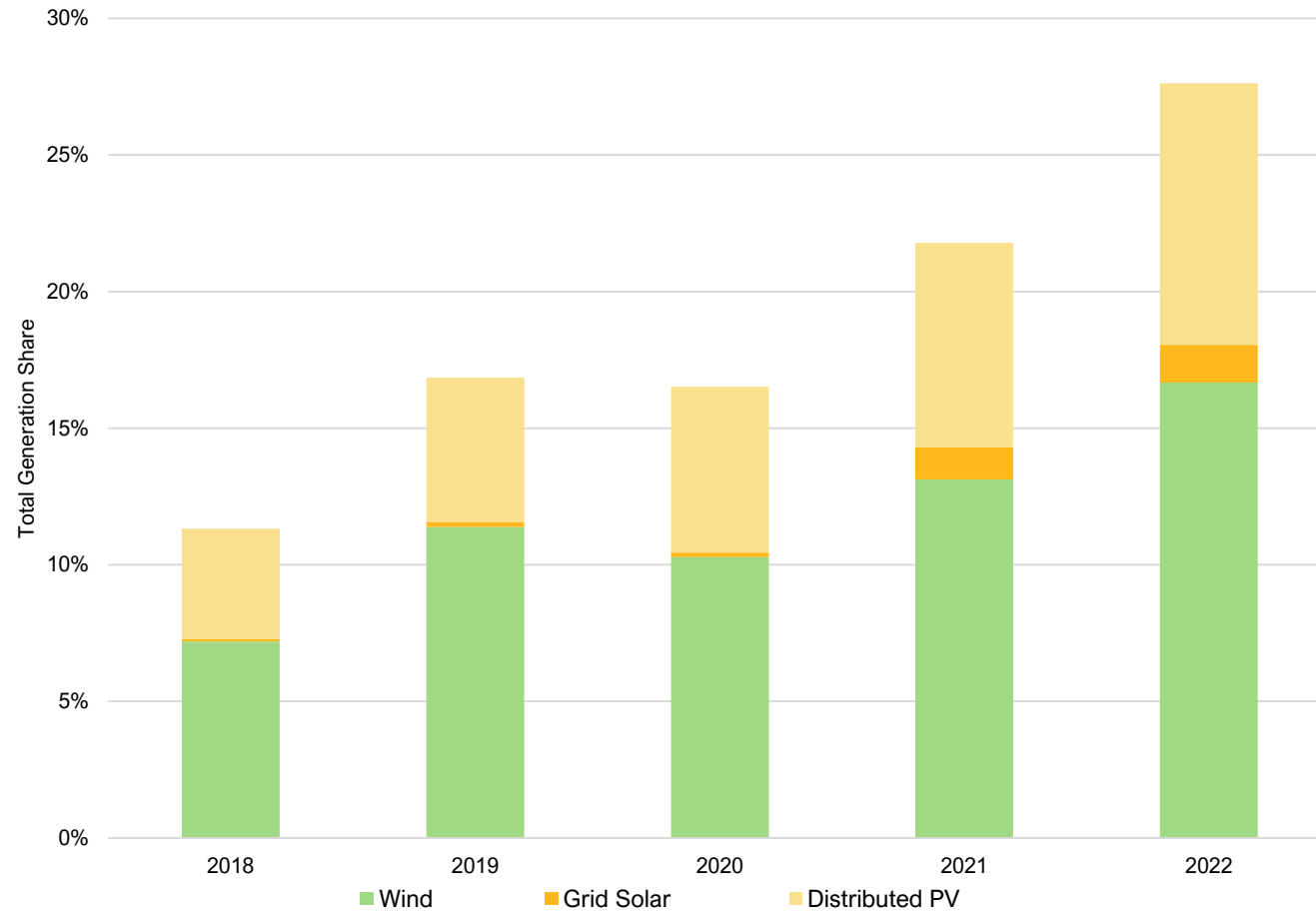
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Average generation by fuel source – FY22



# Growth in renewable generation continues

## Renewable Generation Share – Quarter 2



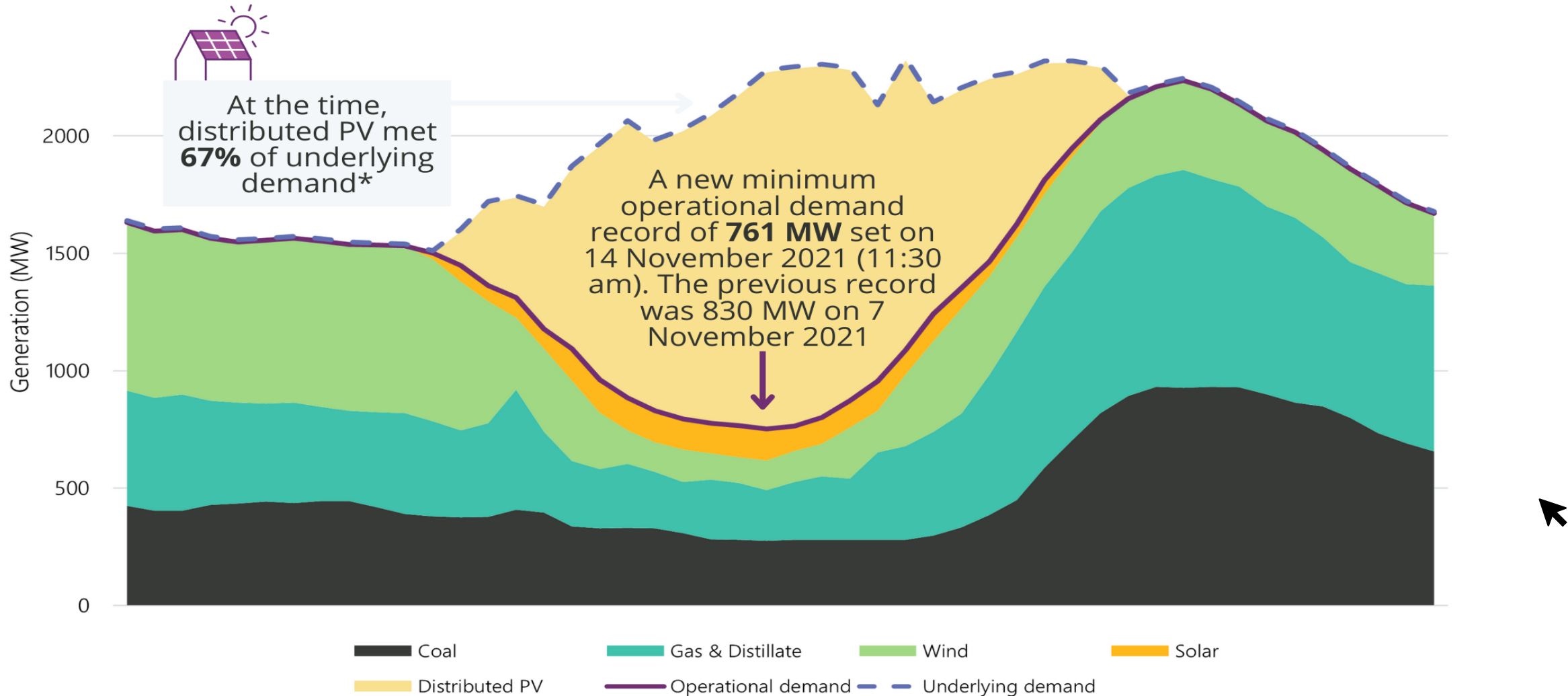
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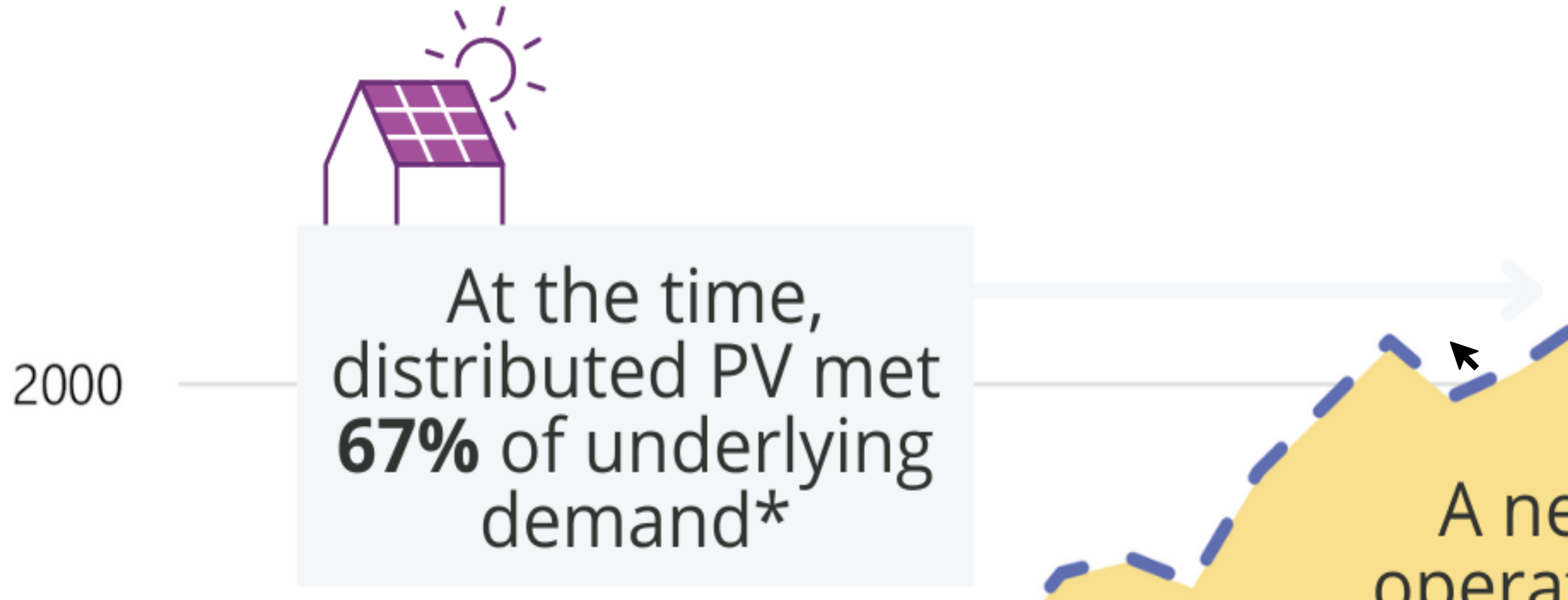
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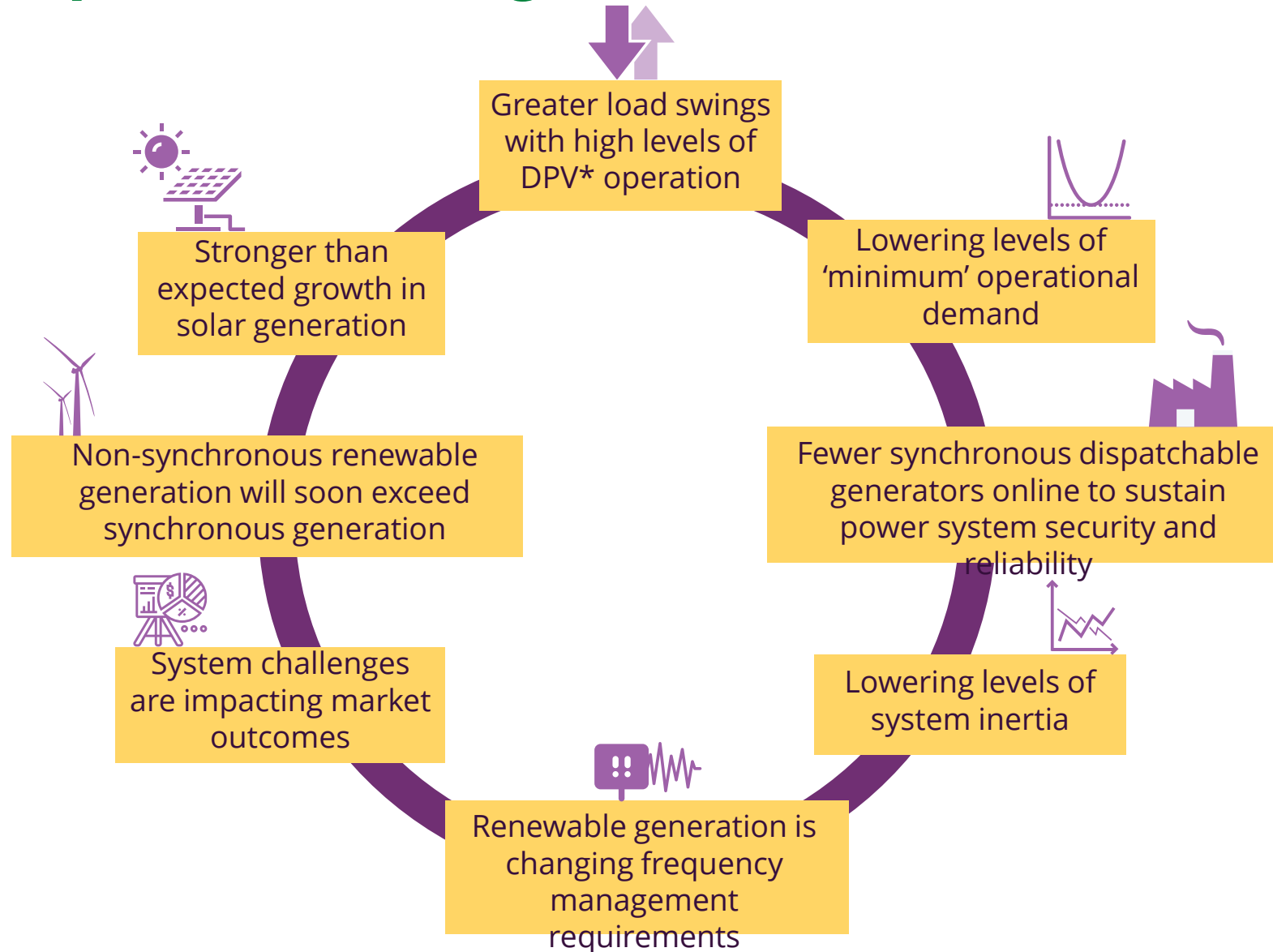


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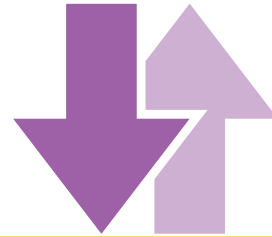
Renewables driving record low electricity from the grid



# System Impacts of change



# System Impacts of change



Greater load swings  
with high levels of  
DPV\* operation

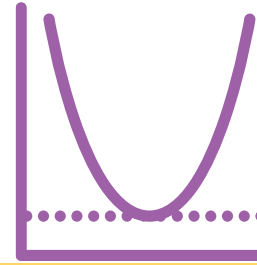
an expected growth in solar generation

Lowering levels of 'minimum' operation



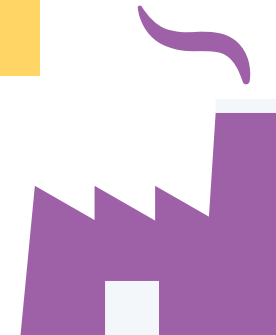
swings with high levels of  
 $PV^*$  operation

## System Impacts of change



Lowering levels of  
'minimum' operational  
demand

Fewer synchronous dispatchable generators online to sustain power system security  
and reliability



# System Impacts of change

Fewer synchronous dispatchable  
generators online to sustain power system  
security and reliability



Lowering levels of system inertia

power system security and reliability

## System Impacts of change



Lowering levels of system inertia



able generation is changing frequency management requirements

es are impacting market outcomes

## System Impacts of change

Lowering levels of system iner



Renewable generation is  
changing frequency  
management requirements

# System Impacts of change



System challenges are impacting market outcomes



Renewable generation is changing from management requirements

# System Impacts of change

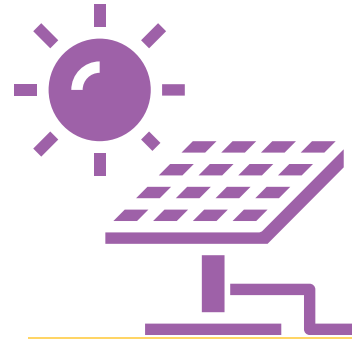


Non-synchronous renewable generation will soon exceed synchronous generation



System challenges are impacting market outcomes


# System Impacts of change



Stronger than expected growth  
in solar generation

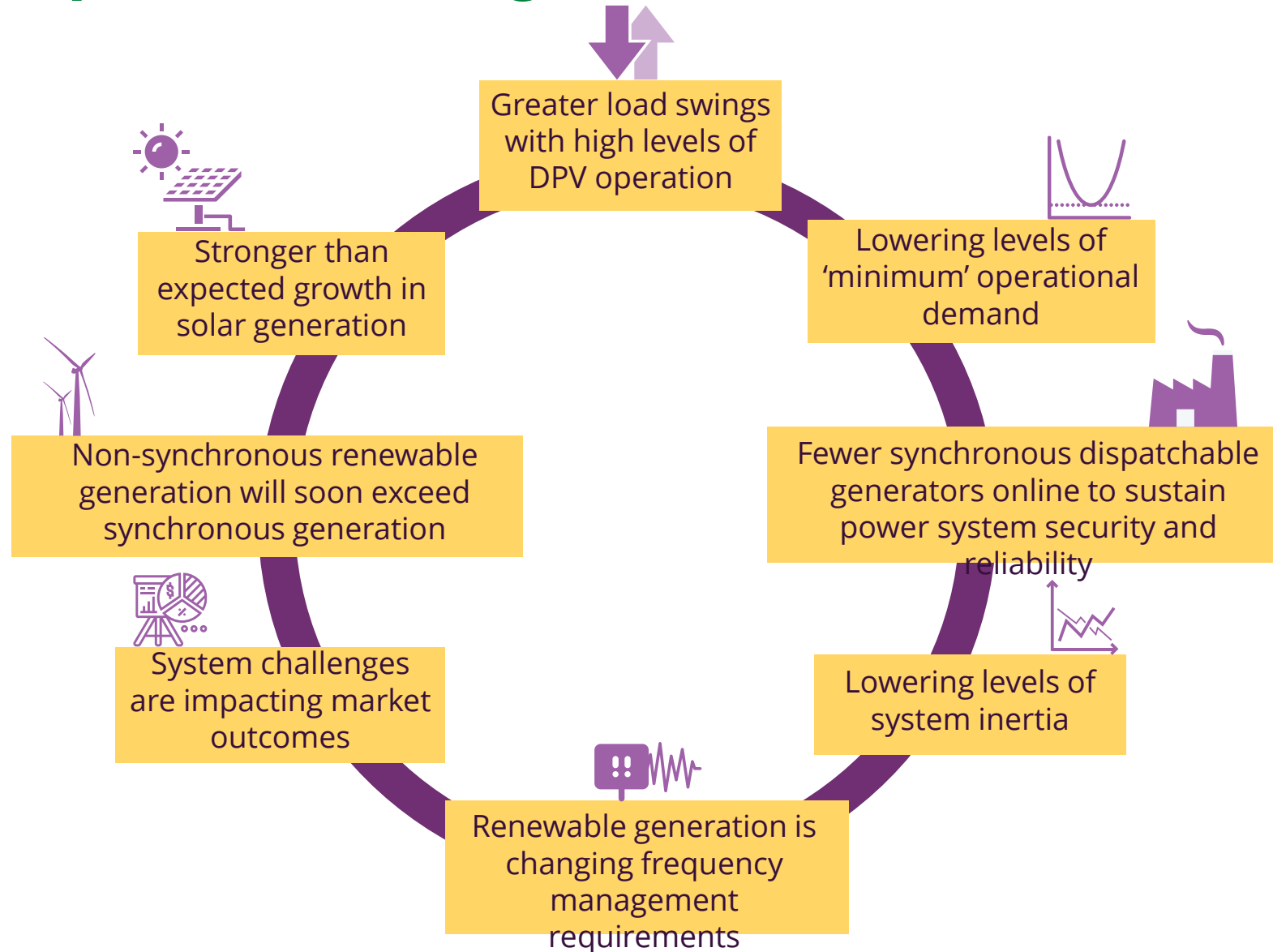


Non-synchronous renewable generation will soon exceed synchronous generation



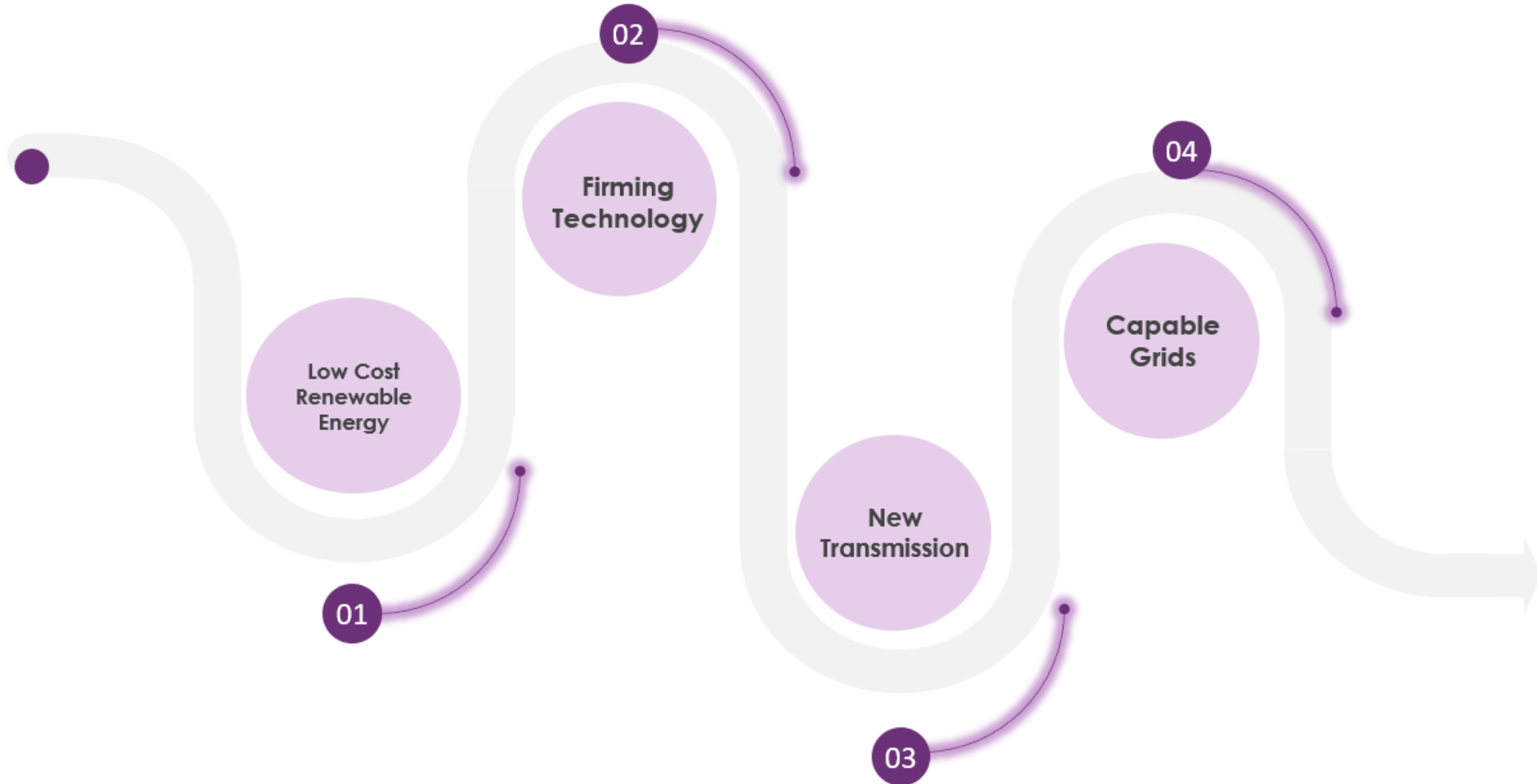
Greater load swings with high level  
DPV\* operation

# System Impacts of change





# How to Net Zero?





**Firming  
Technology**

**Low Cost  
Renewable  
Energy**

**N  
Trans**

**01**

# How to Net Zero?

02

**Firming  
Technology**

**Low Cost  
Renewable**



**Capable  
Grids**



**New  
Transmission**



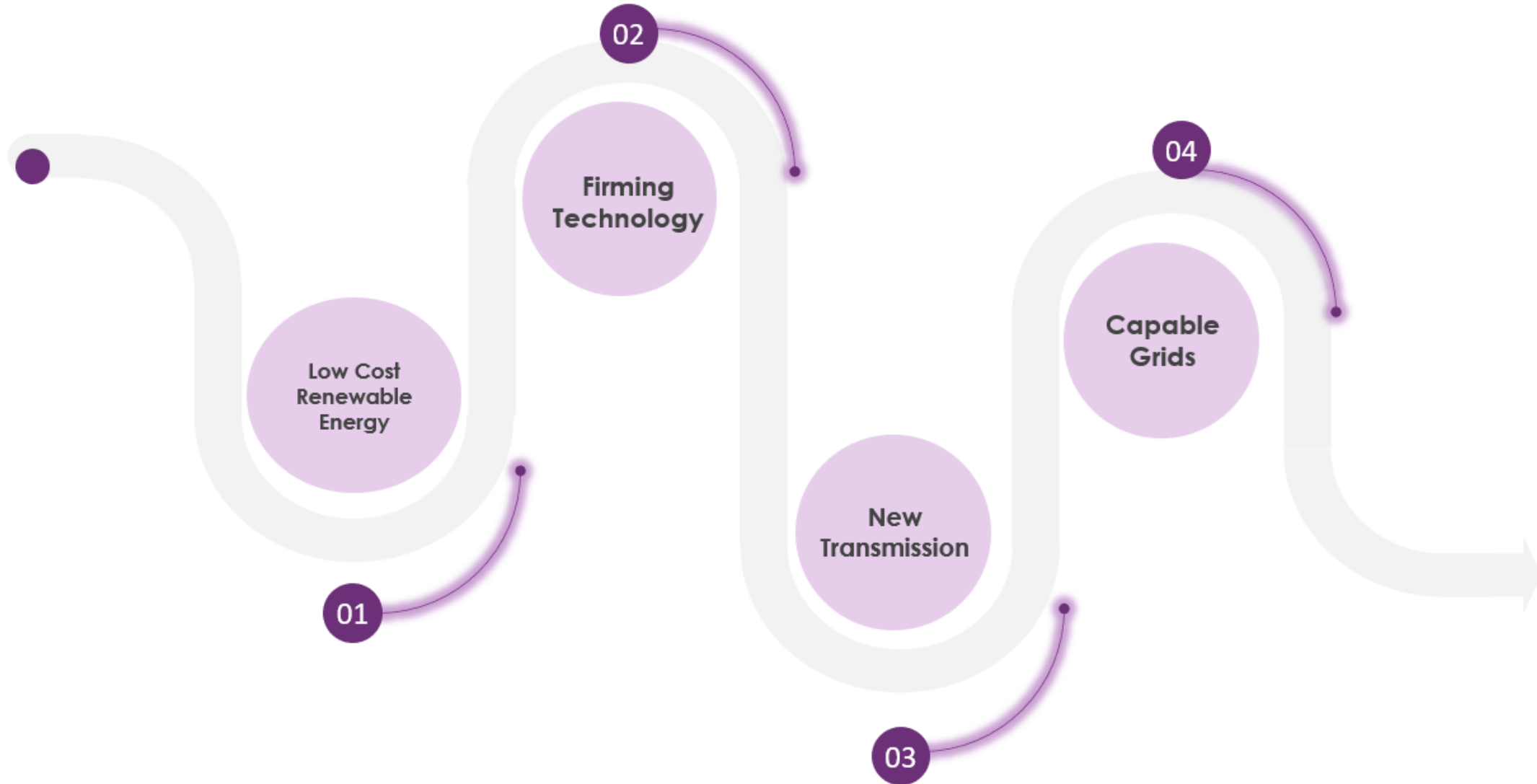
**03**

04

**Capable  
Grids**

**New  
Transmission**

# How to Net Zero?



# How Does Future Look Like?

- Modern regulatory framework
- Bigger, Better, Smarter Networks
- Modern Grids
- Advanced tools
- Need to build the pipeline of talents.



# Thank You

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