



دائرة الطاقة  
DEPARTMENT OF ENERGY

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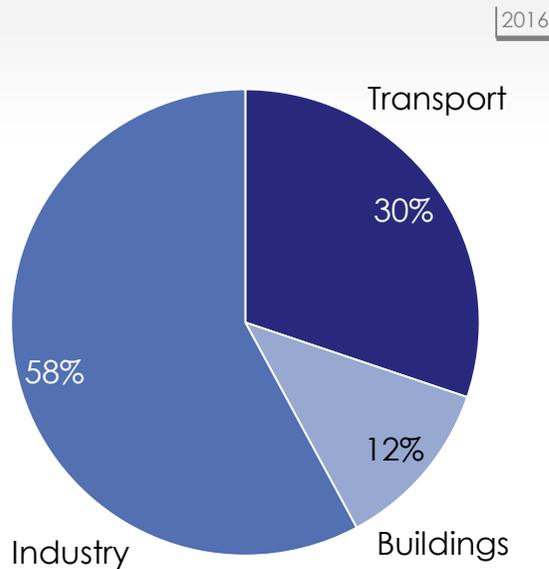
# *Laying the groundwork for future energy era*

LTES, Berlin  
April 2019

**Carlos Gasco Travesedo**  
Abu Dhabi Department of Energy

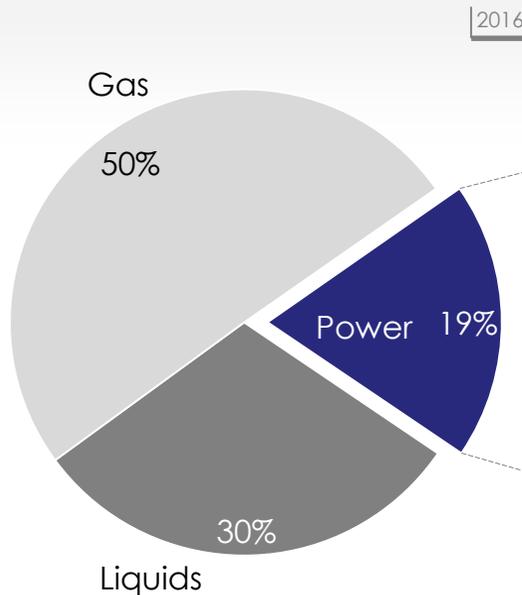
# The Abu Dhabi energy landscape

Energy consumption, Th TJ (100% = 928)



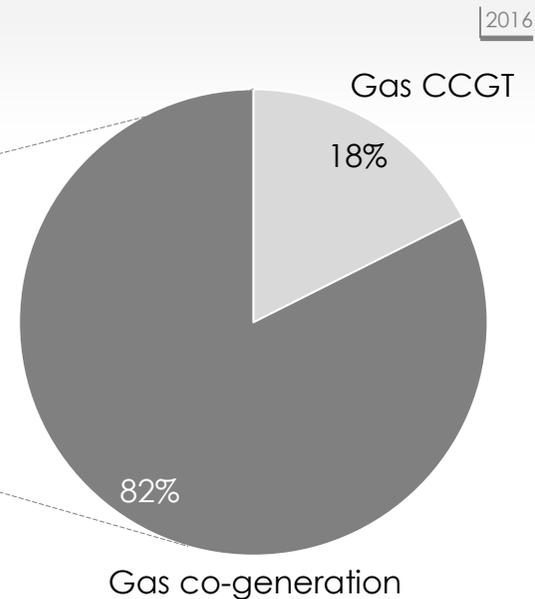
- High energy intensity per capita (0.32 TJ/capita vs. 0.16 OECD average)
- Large energy-intensive industry sector driven by low-cost gas

Energy supply, Th TJ (100% = 928)



- Electrification rate at par with OECD (20% vs. 21% OECD average) driven by buildings
- Gas based system, driven by low-cost gas prices

Power generation, TWh (100% = 74)



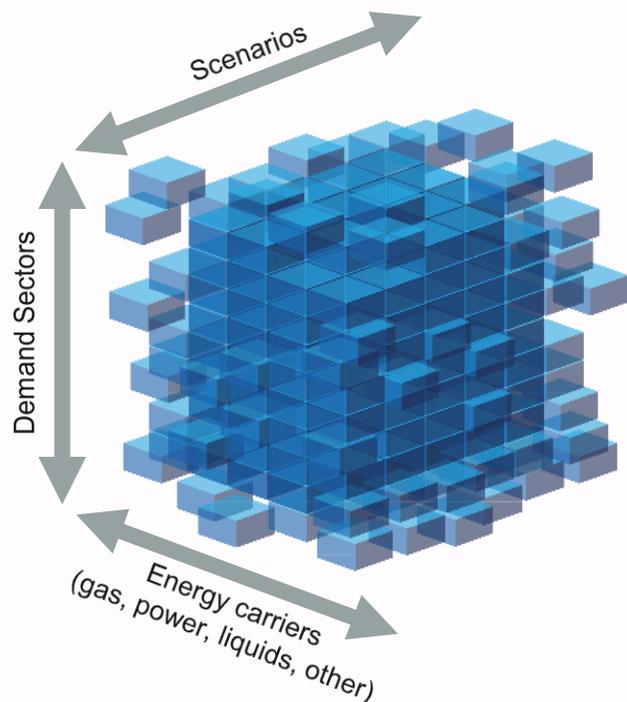
- 100% gas-based system, mainly co-generation with water (<1% solar in 2016,
- *Noor PV @950MW on line in 2019* )



# How is Abu Dhabi preparing for its energy transition?



## Abu Dhabi – Integrated energy model: annual forecast from 2016 to 2050 and policy impact assessment to navigate the energy transition



### Demand module

- 20 energy demand segments / sub-segments
- Split by energy carriers

### Supply module

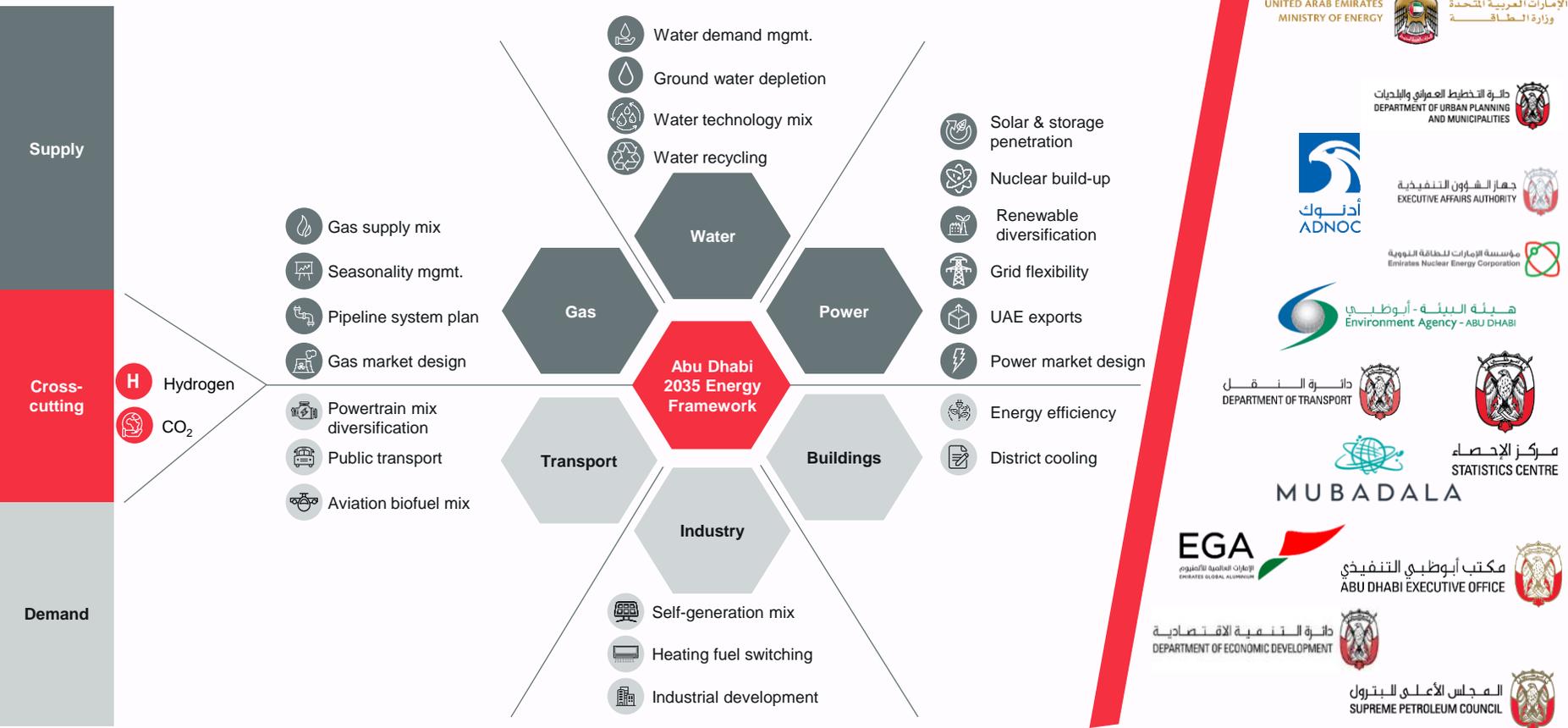
- Power model with optimization engine
- Gas supply/demand balancing model
- Integration with demand by energy carrier

### Output module

- Quantification of 4 system core drivers: system cost, CO2 emissions, security of supply, economic development

Testing of  
60+  
policies

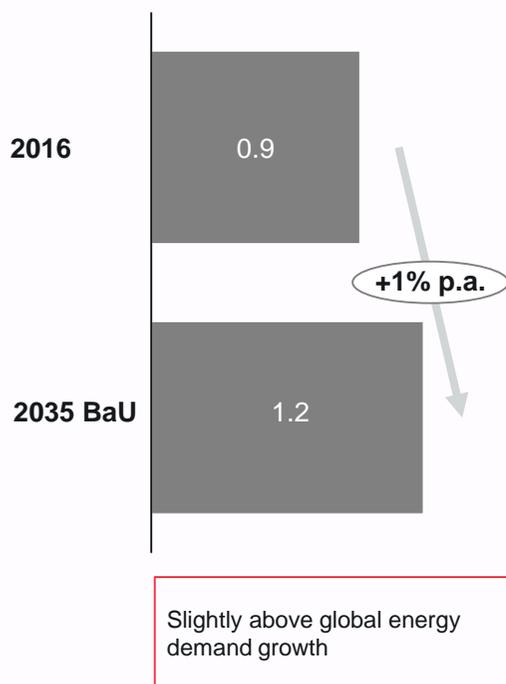
# Abu Dhabi - Supporting integrated energy policy framework developed with key stakeholders



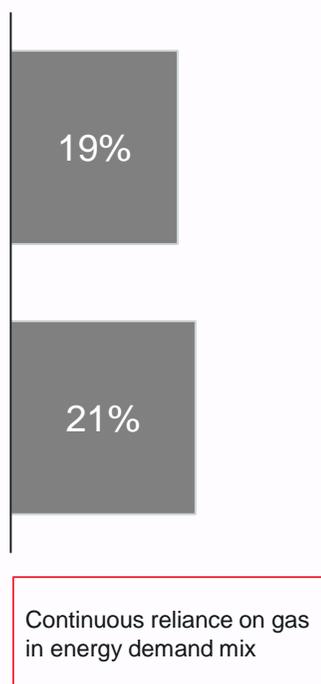
SOURCE: Abu Dhabi Department of Energy

## Abu Dhabi – 2035 Reference Case, assuming no policy intervention beyond current plans and trajectory

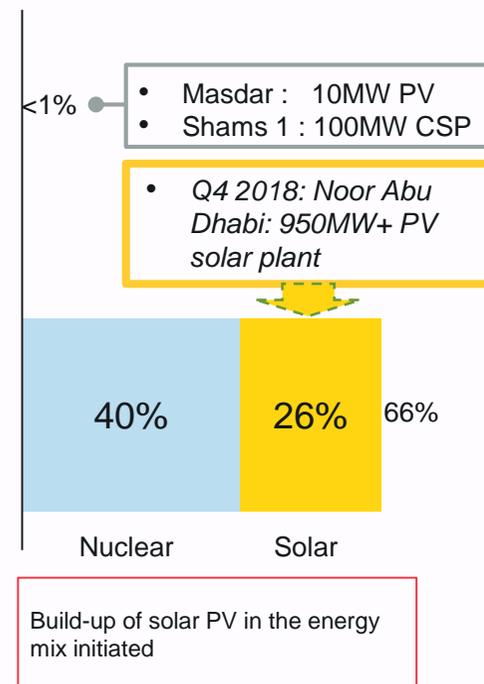
Total Primary Energy Demand, Mn TJ



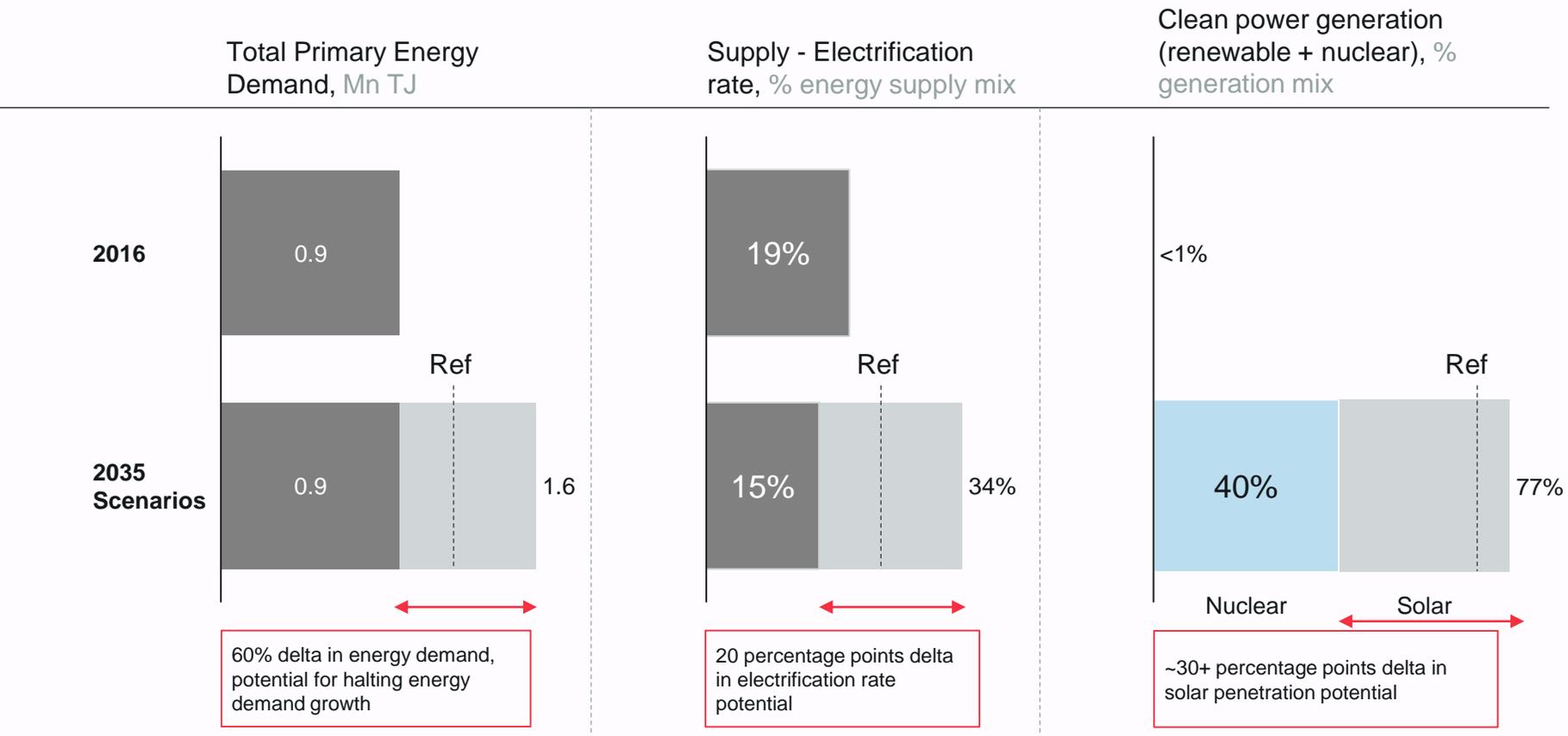
Supply - Electrification rate, % energy supply mix



Clean power generation (renewable + nuclear), % generation mix



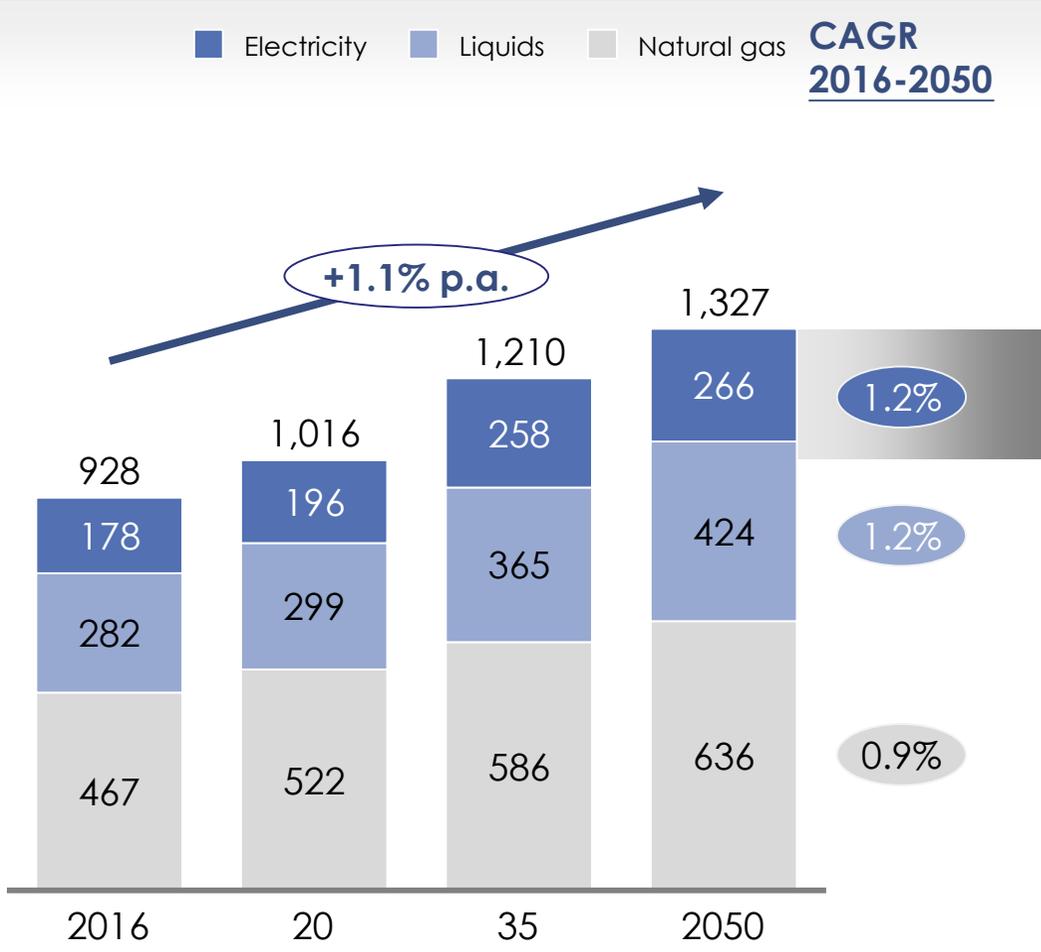
# Abu Dhabi – Potential impact range of policy decisions on 2035 energy system



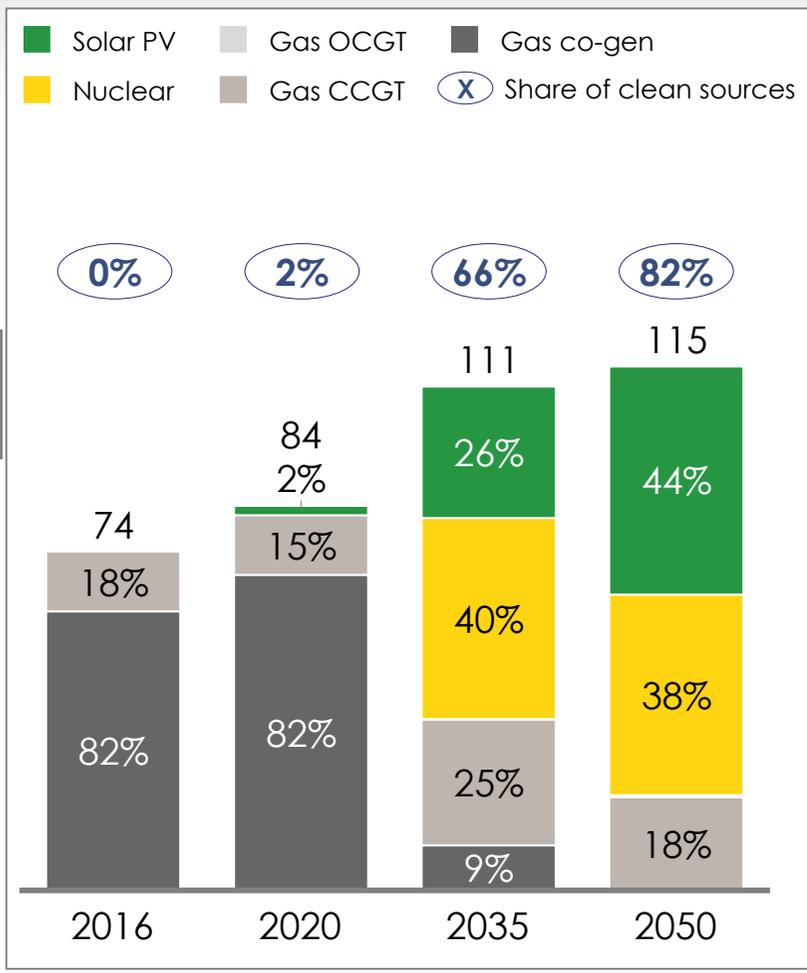
SOURCE: Abu Dhabi energy model, Abu Dhabi Department of Energy

# Supply-side remains gas dependent, but power mix changes with clean technologies accounting for majority of 2035/2050 power generation

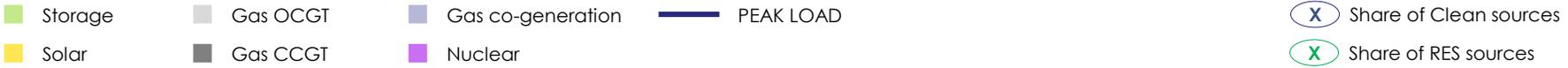
Final energy consumption by fuel, Th TJ



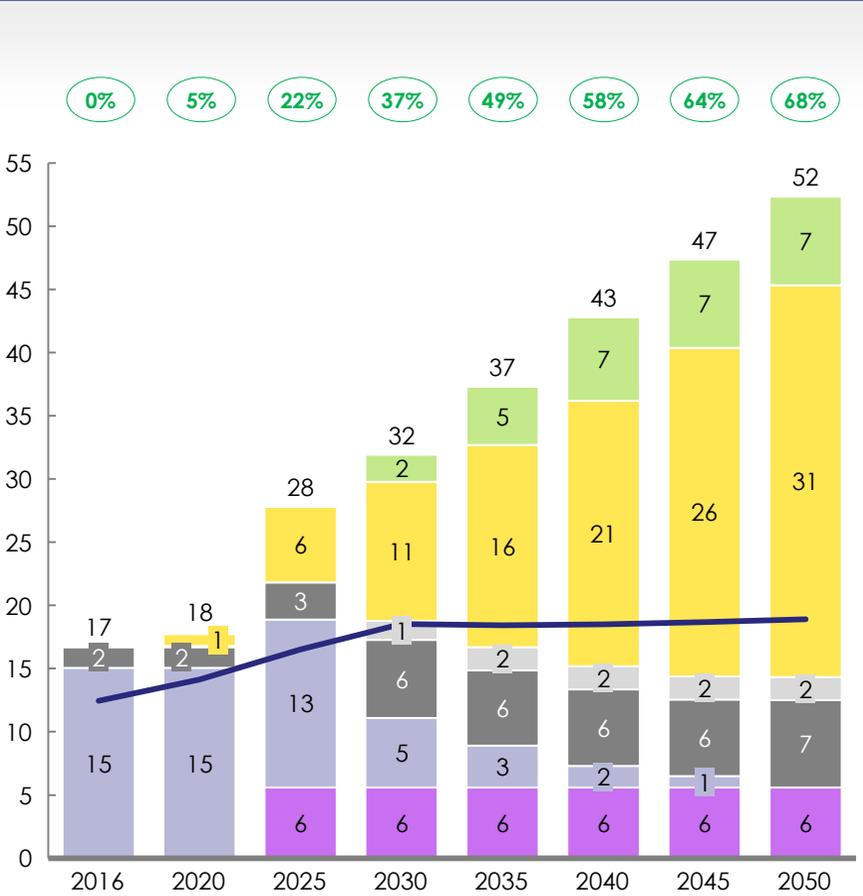
Generation mix, TWh



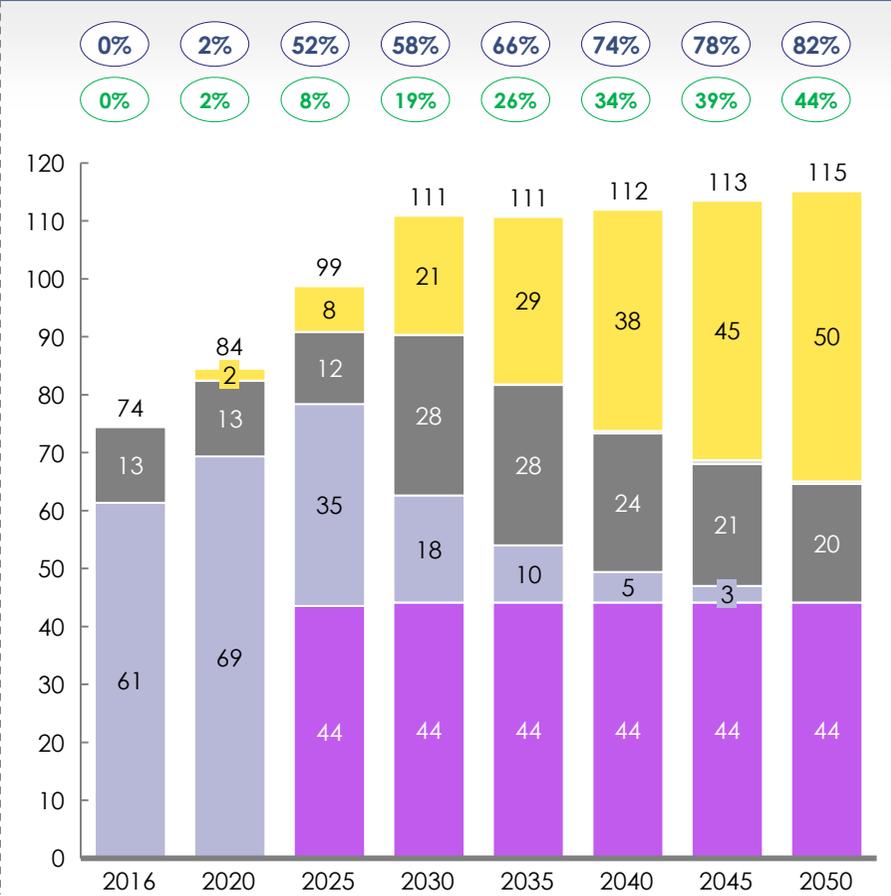
# 2 Clean generation with baseload nuclear and solar PV supported by storage dominates long-term generation mix, gas pushed to dispatch flexibility role



Capacity mix, GW



Generation mix, TWh



1 Including solar and waste-to-energy plants, excluding storage

## Abu Dhabi - Ambitions with our stakeholders for a cleaner and more efficient energy system by 2035

### Demand



#### Buildings

*Significant electricity and water efficiency gains*



#### Transport

*Accelerated electrification of road transport sector*



#### Industry

*Transition to a cleaner cost competitive industry*

### Supply



#### Power

*Up to 80% clean power generation*



#### Water

*~85% de-coupling of co-generation and efficient consumption*



#### Gas

*Optimized gas allocation and infrastructure*

# The Integrated Energy Model has been built as part of the policy framework development for Abu Dhabi

