



## 9<sup>th</sup> Annual Dii Desert Energy Leadership Summit

# “Enabling Clean Energy Transition in the GCC and Beyond”

*Ahmed Al-Ebrahim*  
CEO- GCC Interconnection Authority



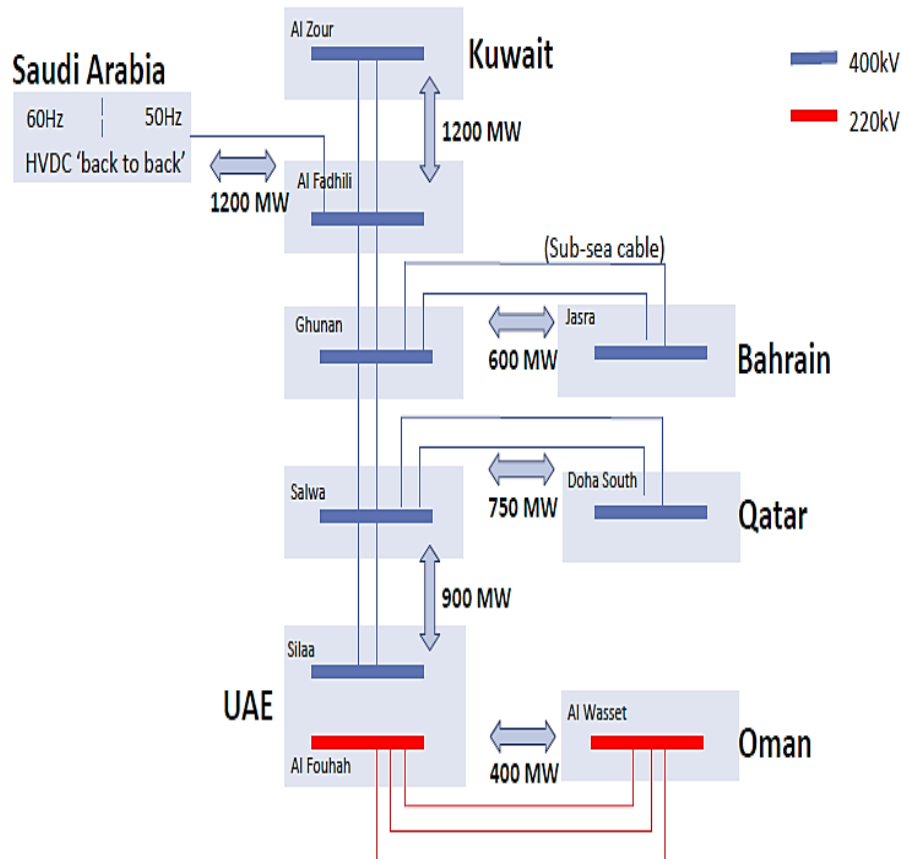
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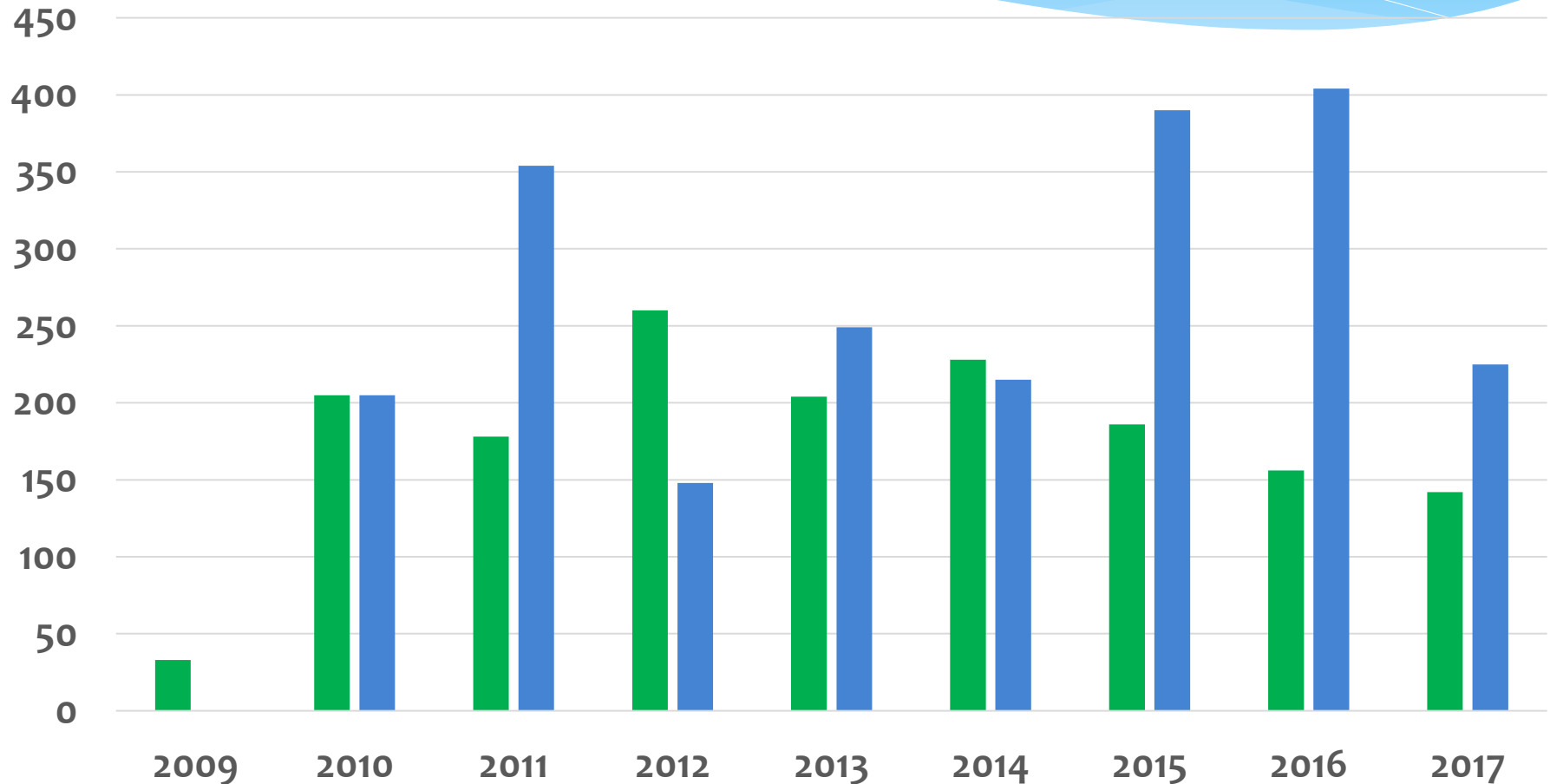
# The GCC Interconnector – A Unique Structure

- A Regional Backbone Structure
- Coordinated Operation - sets Operational Rules and targets
- Coordinated Planning – sets Generation and Interconnector expansion targets





## Benefits of the GCC Interconnection 2009-2017



■ Number of Emergency Support Cases

■ Economic Savings to GCC countries due to the Interconnections (Mil US\$)



## Required GCC investment from 2017-2021 in US\$ Bn.

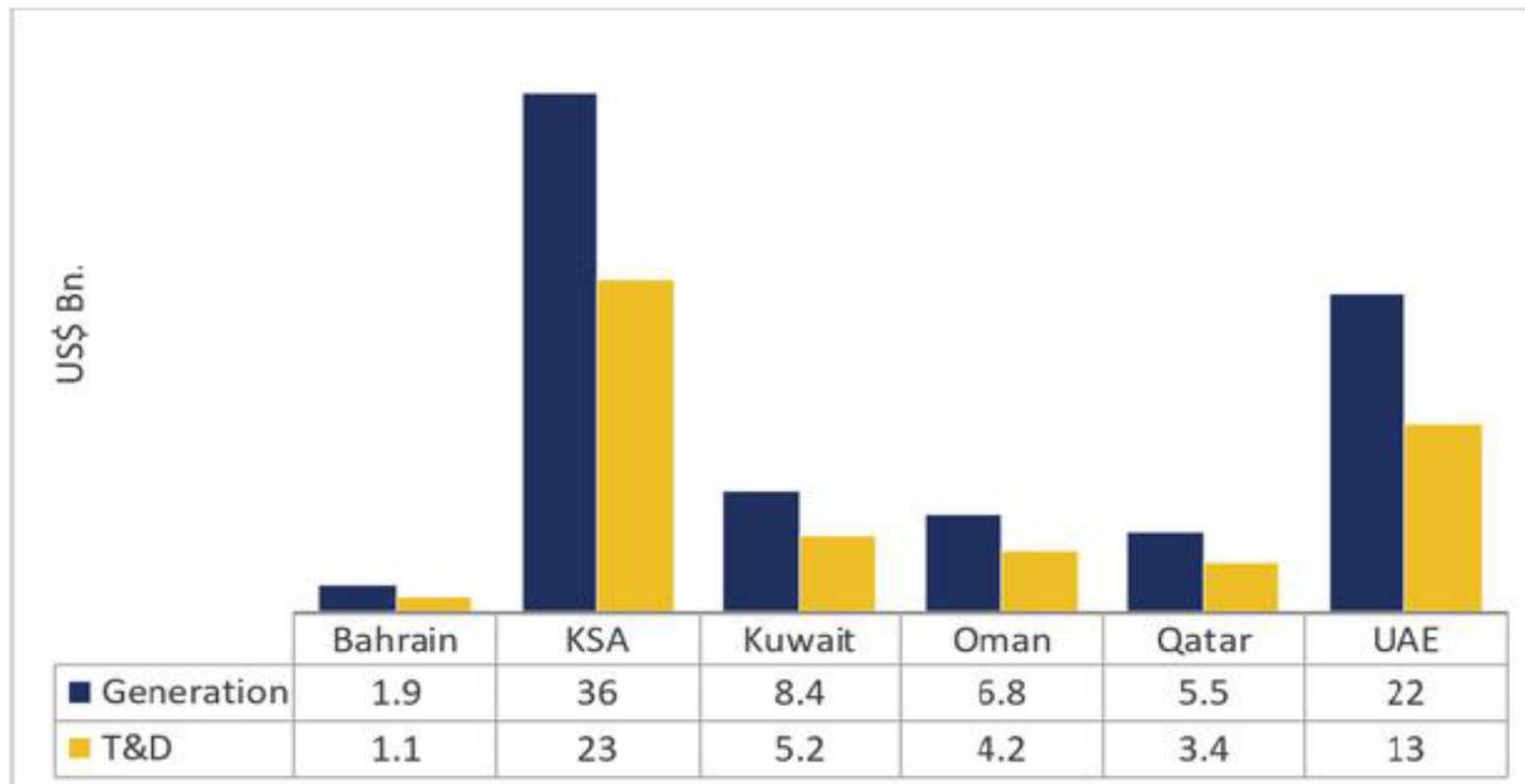


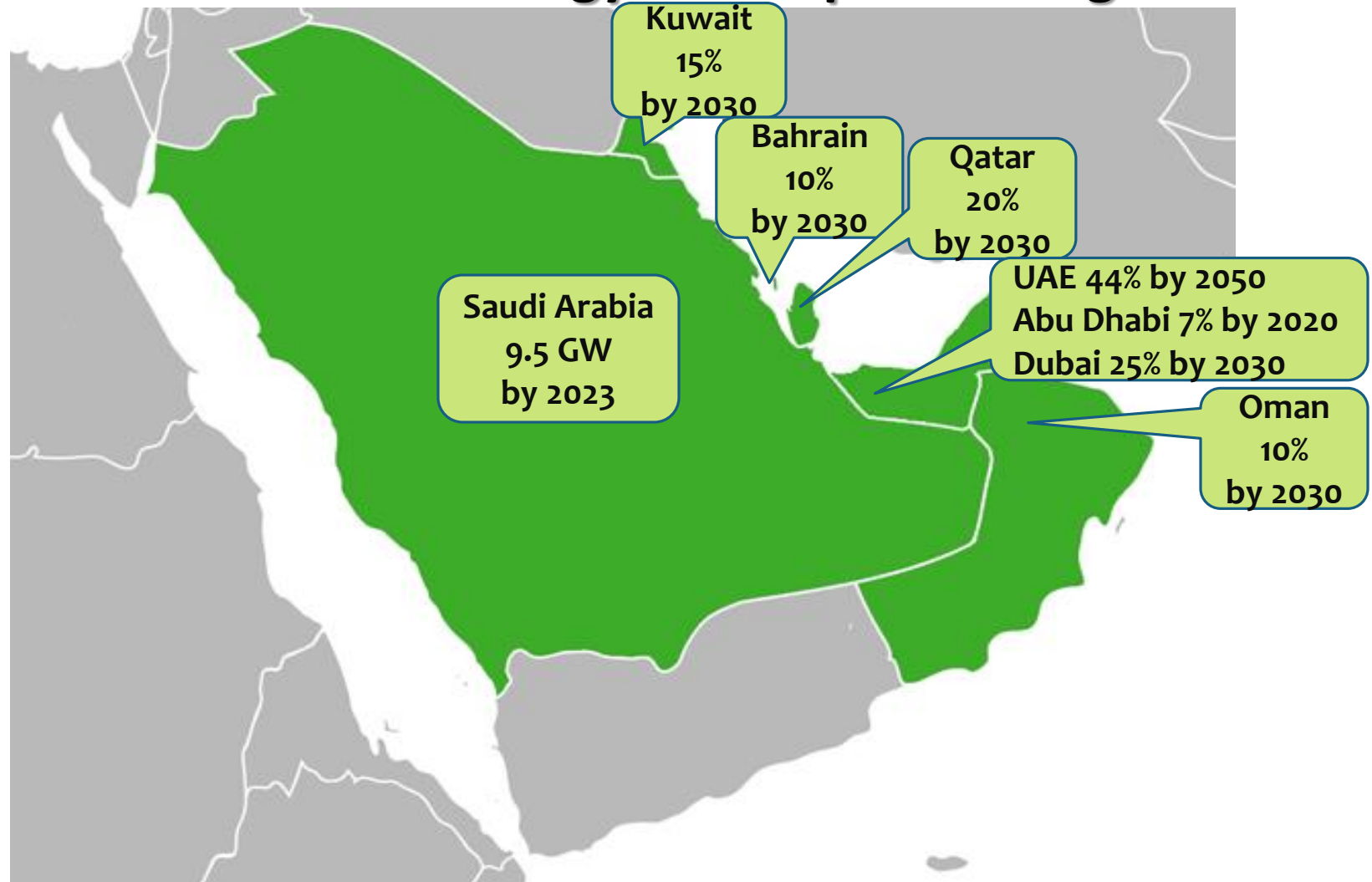
Figure 1. Note: T&D-Transmission and Distribution. Source: APICORP Research

Courtesy: MIDDLE EAST ELECTRICITY 2018

GCC POWER MARKET REPORT NOVEMBER 2017 - BY VENTURES ONSITE



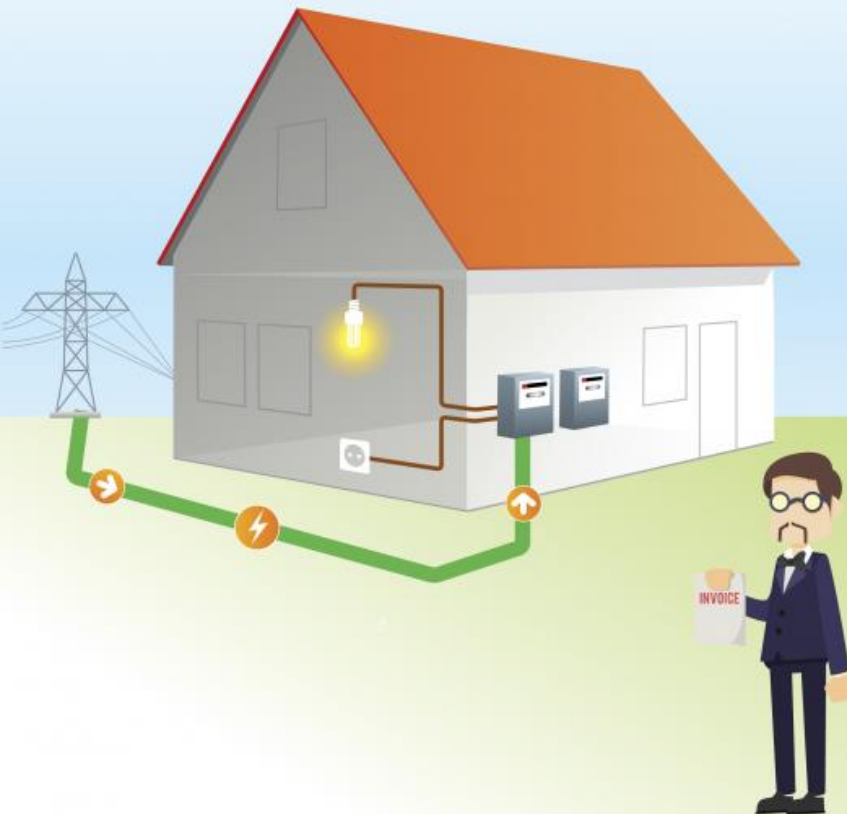
## GCC Renewable Energy Development Targets





# The Shift from CONsumers to PROsumers

## CONSUMER



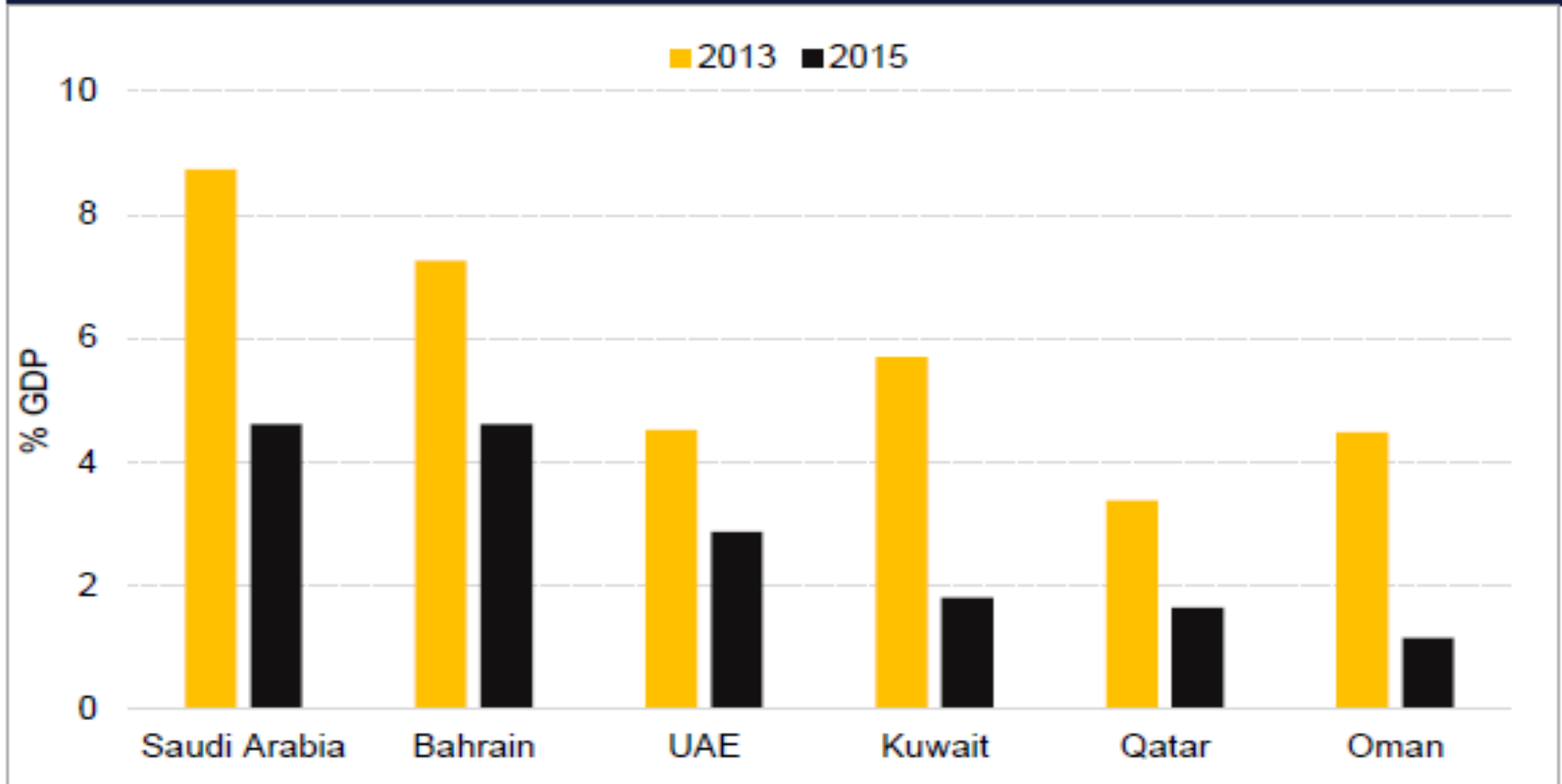
## PROSUMER





## Energy Subsidies Reforms in GCC

### Amount spent on energy subsidies (% GDP)



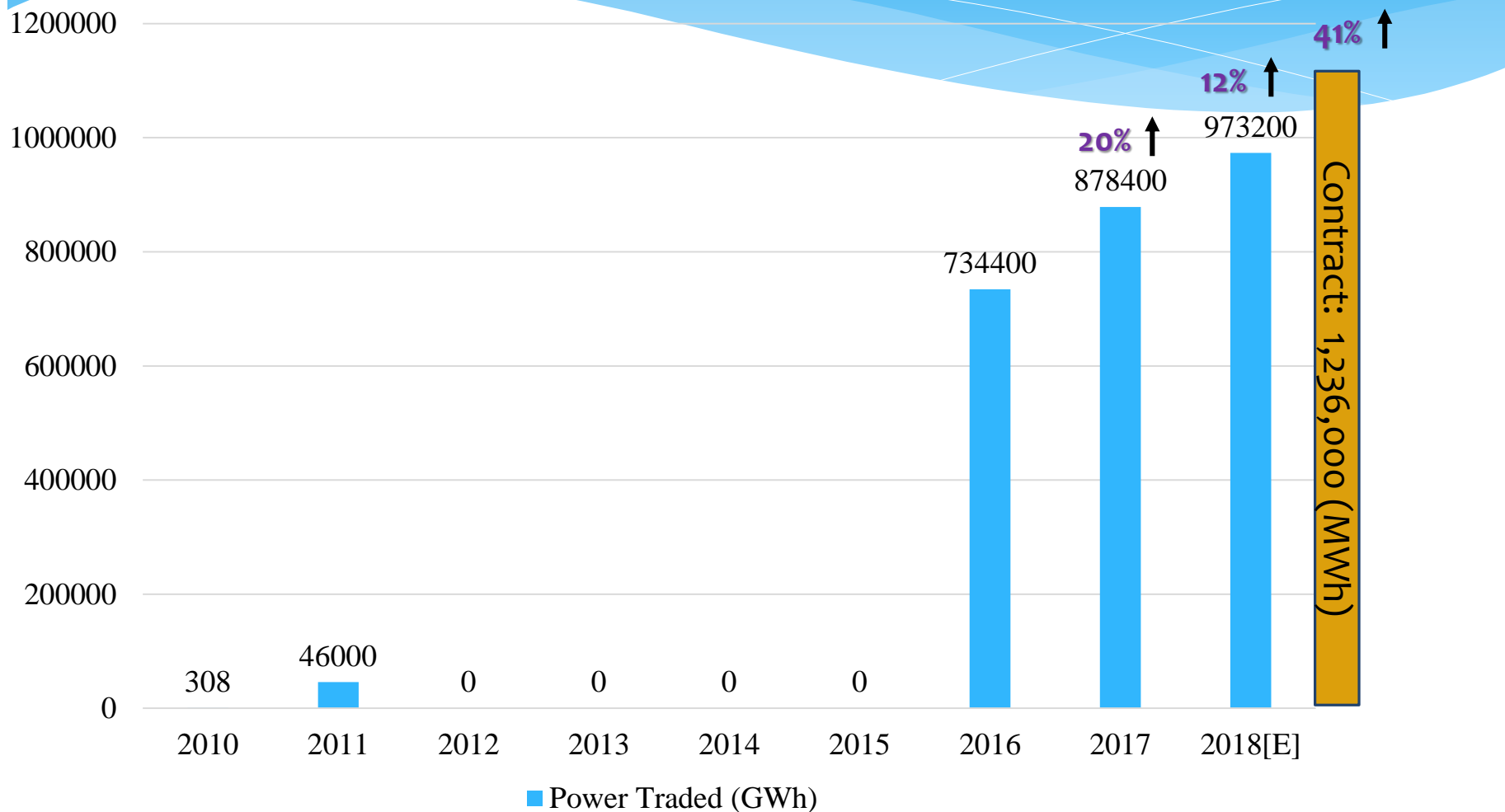
Source: IMF, Emirates NBD Research





# Volume of Power Traded on the GCC Interconnection

## 2010 – 2018







# GCCIA Expansion Study: External Expansion: looking for interconnection to Promising corridors

## Corridors towards Europe / Turkey

- Complementary seasonal diversity between Europe / Turkey and GCC .. Excess renewable (solar) energy in GCC
- Jordan being a hub for interconnecting to neighbouring system : Iraq, Syria, Egypt, Turkey
- Egypt : Interconnect with Europe thru Euro-Africa 2000 MW Interconnection
- Iraq : HVDC backbone towards Turkey

## Corridors towards Africa : Ethiopia

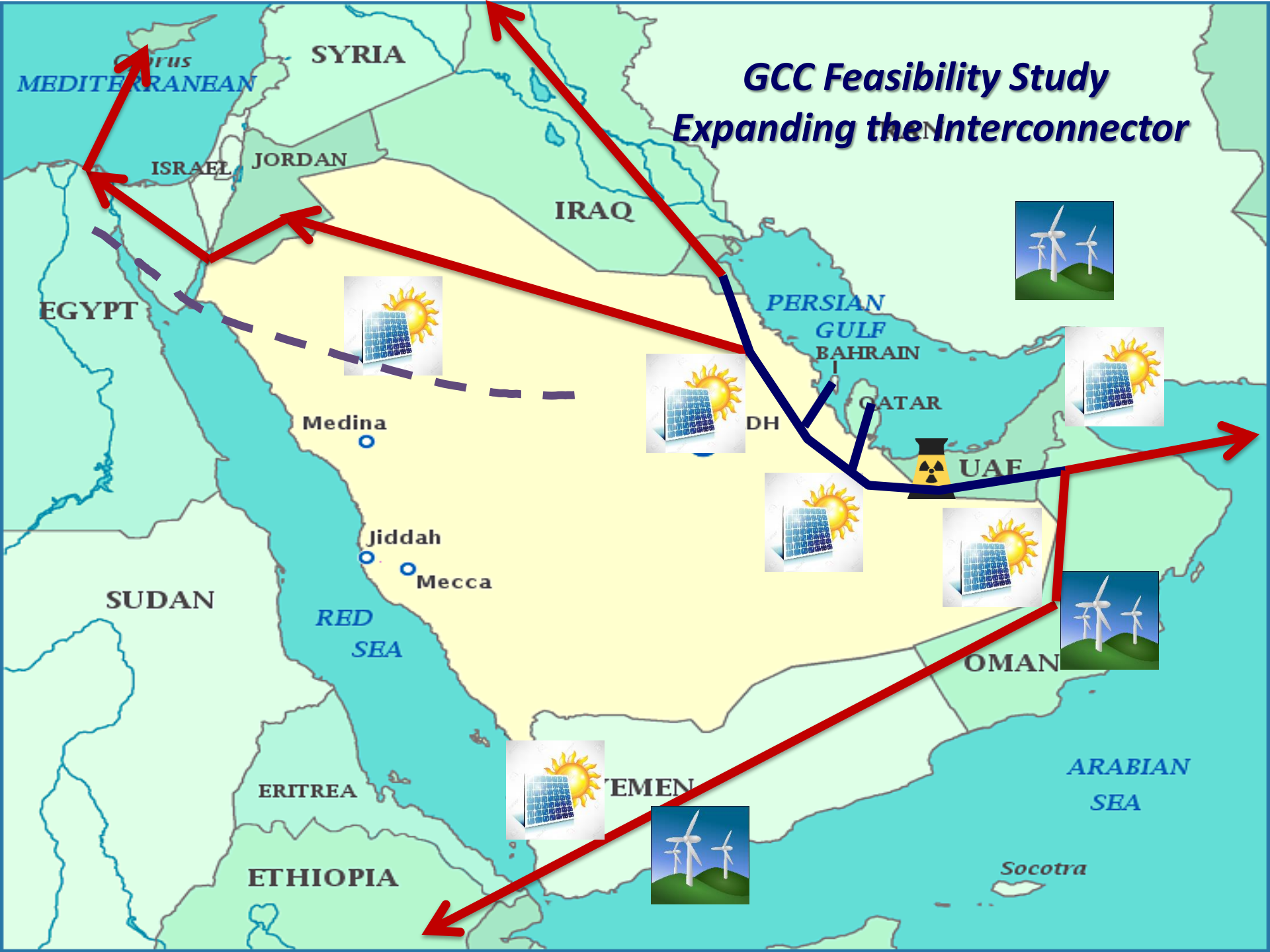
- Complementary Solar Energy (Saudi Arabia) / Hydro (Ethiopia) with storage capabilities

## Corridors towards Asia : India , Pakistan

- Complementary seasonal time diversity between south-east Asia and GCC .. Excess renewable (solar) energy in GCC

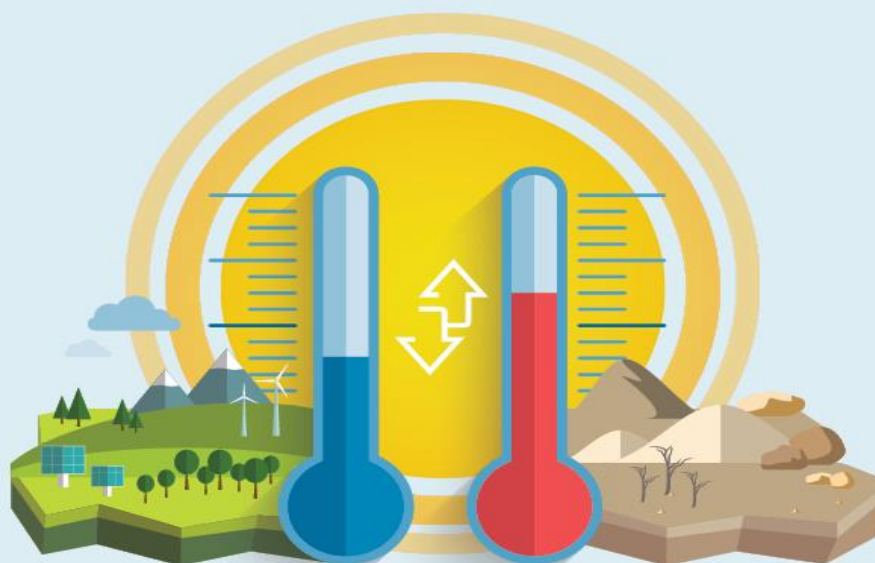


# ***GCC Feasibility Study Expanding the Interconnector***





## COP21 – Historical Agreement



**In Paris, the world agreed to keep temperature rise below 2°C and if possible 1.5°C. Renewable energy and energy efficiency can get us there.**

# GO15 Strategic Working Group

## Pathways to a Low Emission Power System



国家电网  
STATE GRID



# Pathways to a Low Emission Power System

## PRIORITY TOPICS

- **Topic 1: Market design for essential reliability services**
- **Topic 2: Distributed Energy Resources (DER) market participation**
- **Topic 3: Wholesale/retail pricing alignment**
- **Topic 4: New business models and TSO/DSO coordination**

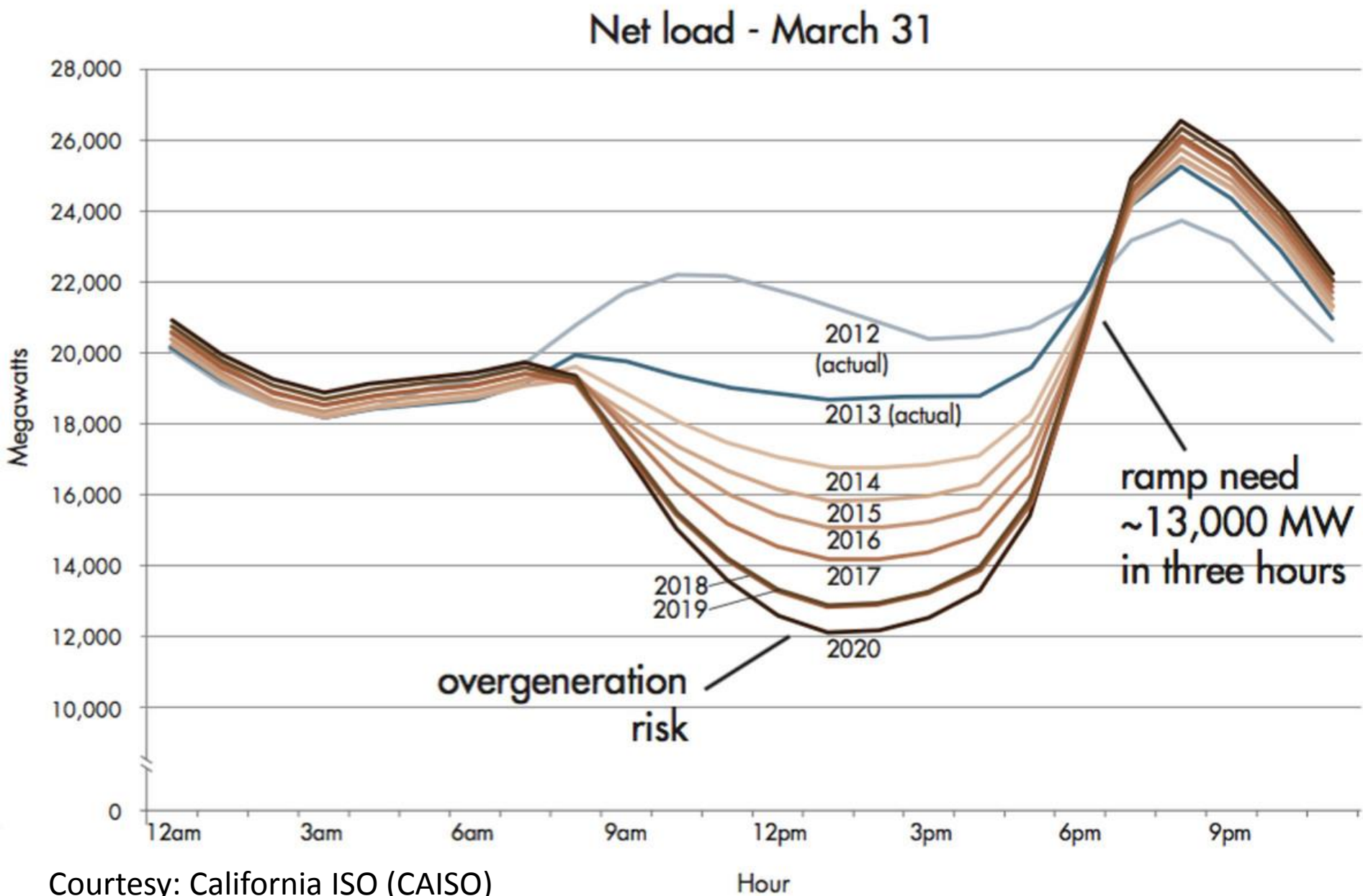


# Pathways to a Low Emission Power System

## PRIORITY TOPICS

- **Topic 5: Forecasting & grid visualization**
- **Topic 6: Long-term planning**
- **Topic 7: Visibility & control of distributed resources**
- **Topic 8: Assessing essential reliability services operational time**

**Figure 2: The duck curve shows steep ramping needs and overgeneration risk**







هيئة الربط الكهربائي لدول مجلس التعاون لدول الخليج العربية  
Gulf Cooperation Council Interconnection Authority

## **GCC Interconnection as an Enabler for Energy Transition Towards Renewable and Clean Energy in the GCC and MENA**

**Coordinated and optimized grid operations at  
real time and planning domains**



**An enabler and facilitator  
of REN integration in the  
GCC**

**Expanding the grid  
beyond GCC and reaching  
opportunities in other  
regions**



**Development of the Power Market in  
GCC and beyond**

# ENERGY TRANSITION SUMMIT

UPDATE

WORLD  
ENERGY  
COUNCIL

World Energy Week  
Milan, 30<sup>th</sup> Oct. 2018

#WEW2018 @ WECouncil

## TRENDS

REGULATORY  
Framework

CONSUMERS

Research of  
Innovation

Long Term  
Strategy

## DIGITALIZATION

to IMPROVE EFFICIENCY

GAS

RENEWABLE

QUALITY of AIR

DIGITALIZATION  
of CUSTOMERS

AS PUBLIC ACTORS WE HAVE RESPONSIBILITY

## INNOVATIONS

HYDROGEN  
AMMONIA  
PIPELINE  
is moving

efficient but  
TOXIC  
NEEDS  
HIGH  
STANDARD

2020  
COMMERCE  
in JAPAN  
2024 on  
MARKET

## INTEGRATION of

IT into OT

we have  
ALL the  
SKILLS needed

## PROSUMER

PRODUCER + CONSUMER

Need  
MARKET  
NOW

Burden &  
honor

## MARKET

Attract MORE  
INVESTORS

## SUBSTITUTES

el niño  
OPPORTUNITY

DATA will  
be CENTRAL

## DIGITALIZATION

is the ONLY one  
which DOES MATTER

to us for  
REAL  
EFFICIENCY

in RUSSIA  
TRANSITION is  
HAPPENING

but slower  
for ECO-POLICY situation

## CITY Dynamic

Electric Vehicle  
they exist, but...  
HOW to  
CHARGE?

STORAGE

"it is all about  
HOW to MAKE things  
HAPPEN"

INFRA-  
STRUCTURE

WHO is GOING  
to PAY?

Let's THINK  
SYSTEMIC

How to  
INVEST  
and  
BE  
SCALABLE

ENERGY  
CONNECTS  
WITH  
LIFE

TO SUPPORT US

POLICIES HAVE

GRAPHIC RECORDING by @ilariavisual