

THE CHALLENGES OF THE ISLAND ENERGY MARKET OF CYPRUS

Trilateral meeting between Energy Regulators of
Israel, Greece and Cyprus



Cyprus Energy Regulatory Authority
George Shammas
Chairman

October 22nd, Jerusalem

INTRODUCTION

❖ CERA

❖ Cyprus Electricity System current status & Planning
issues

❖ European Energy Policy

❖ RES Penetration Challenges

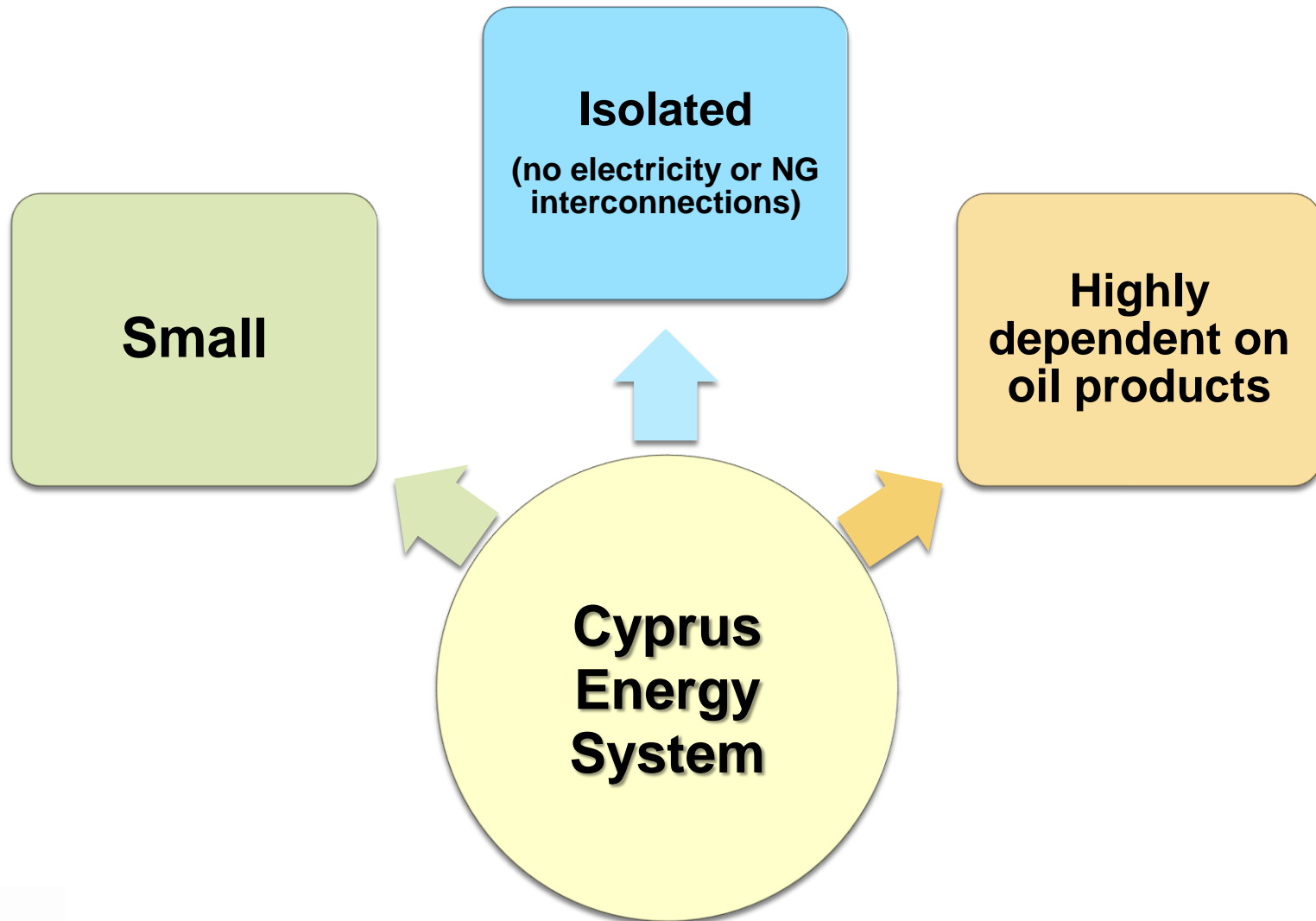
❖ NG Sector & Potential role of Cyprus

CERA'S LEGAL STATUS

- **CERA is the National Energy Regulatory Authority of Cyprus and was established by the Law on Regulating the Electricity Market of 2003, N.122/(I) 2003.**
- **CERA's main task is regulating and supervising Cyprus Energy Market (Electricity & Natural Gas) and Electricity and NG Undertakings**
- **CERA participates in the EU Regulators Bodies CEER & ACER**



CYPRUS ENERGY DATA



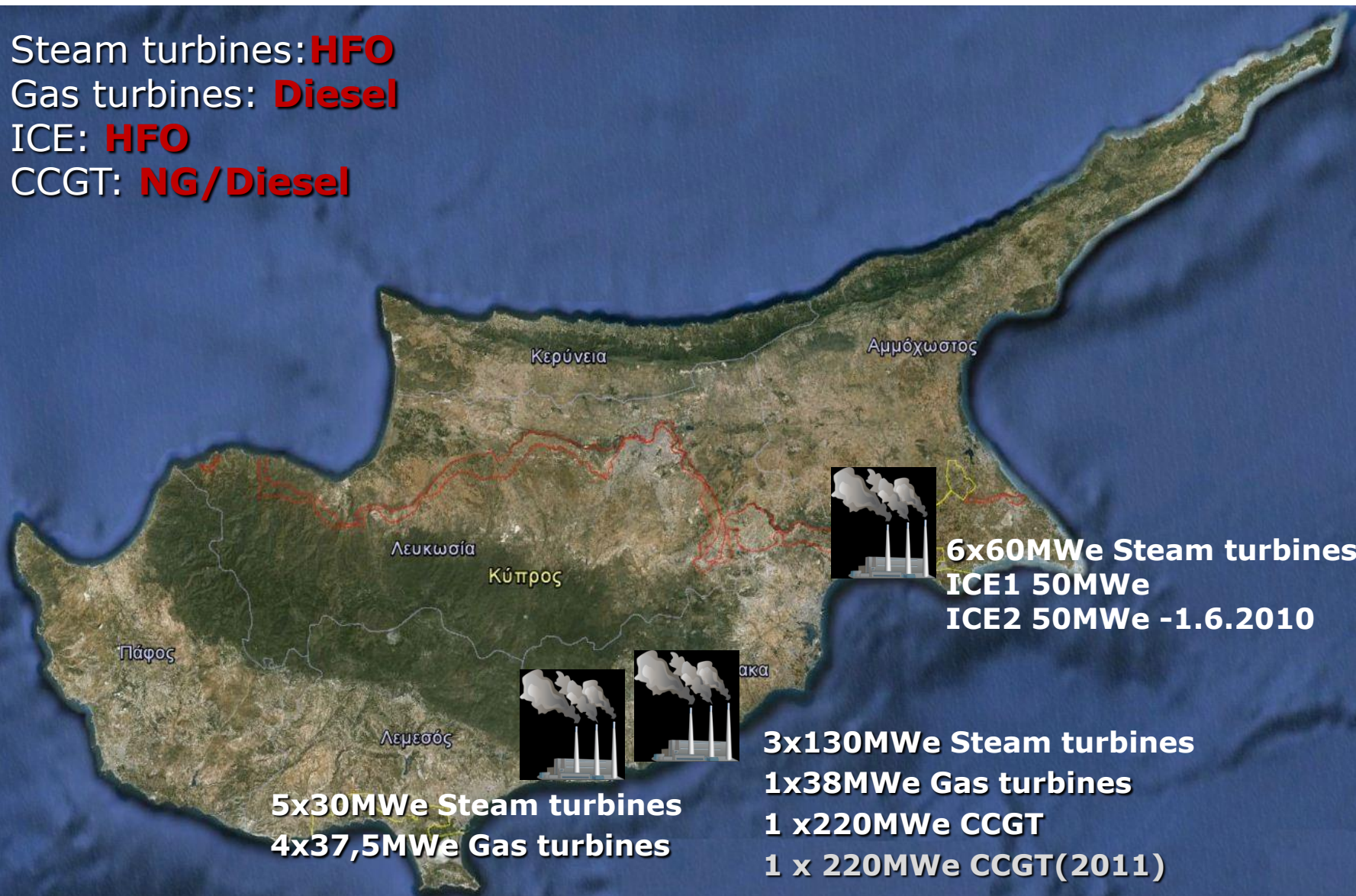
CYPRUS CONVENTIONAL ELECTRICITY GENERATION INSTALLATIONS

Steam turbines: **HFO**

Gas turbines: **Diesel**

ICE: **HFO**

CCGT: **NG/Diesel**

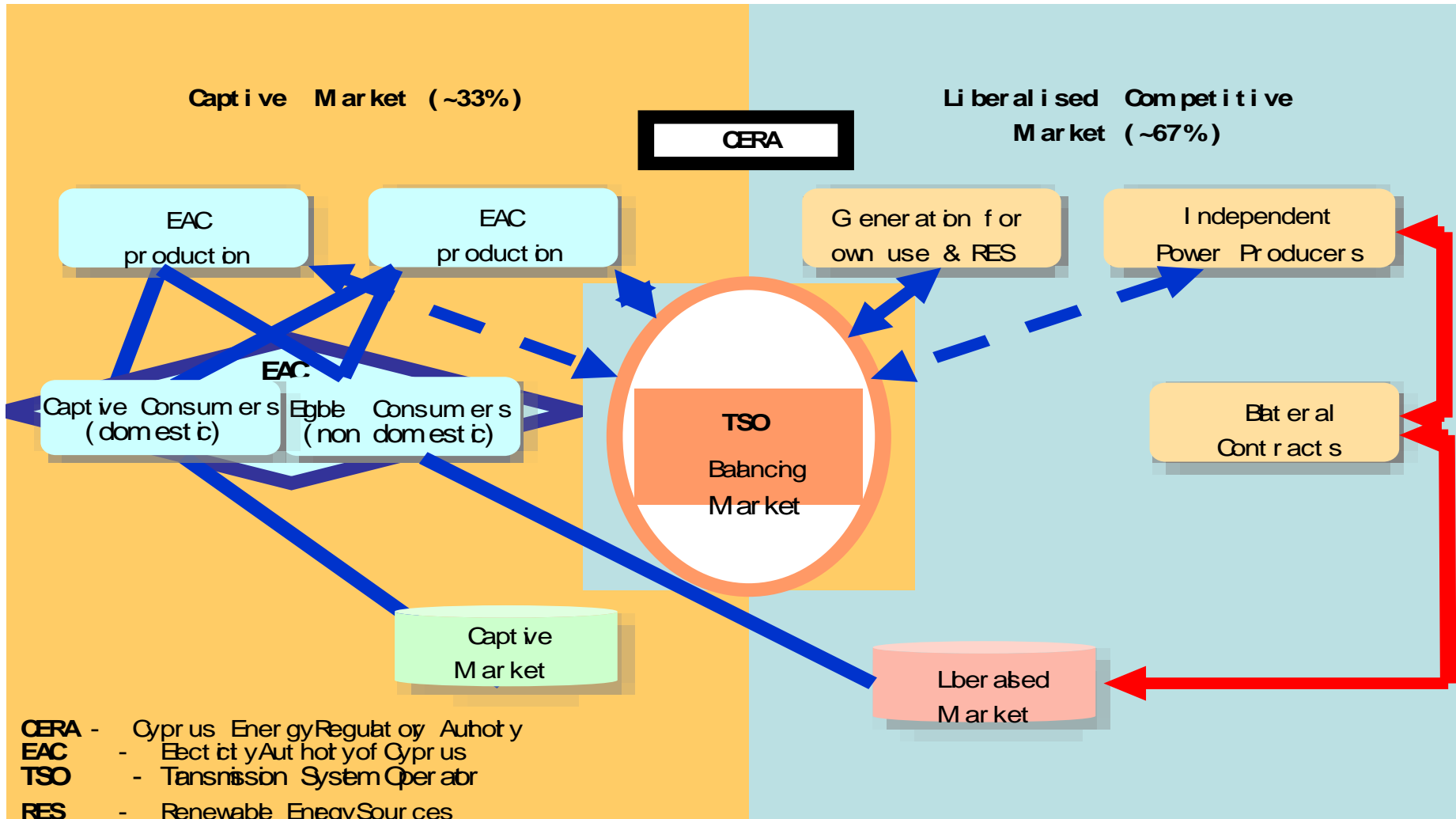


6x60MWe Steam turbines
ICE1 50MWe
ICE2 50MWe -1.6.2010

5x30MWe Steam turbines
4x37,5MWe Gas turbines

3x130MWe Steam turbines
1x38MWe Gas turbines
1 x220MWe CCGT
1 x 220MWe CCGT(2011)

ELECTRICITY MARKET MODEL – BILATERAL AGREEMENTS



2014 – 100% Market opening

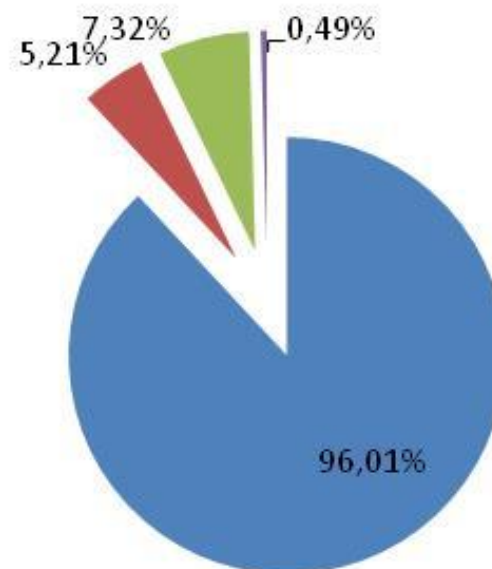
INSTALLED CAPACITY (CONVENTIONAL & RES)

❖ INSTALLED CAPACITY CONVENTIONAL UNITS

Total Available 1018 MW (610 MW under reconstruction)

❖ INSTALLED CAPACITY RES-E – OCTOBER 2012

Wind Farms	146,7 MW
Biomass	8,6 MW
PVs Connected to the grid	11,88 MW
PVs Not connected to the grid	0,75 MW
Total	168,68 MW



POWER GENERATION PLANNING IN SMALL ISLAND

❖ *Long-term*

Achieve Generation adequacy/Capital intensive

❖ *Annual*

Optimisation of maintenance programme to maximise availability of efficient units

❖ *Day – ahead & Intraday*

Optimum dispatch of generating units/balancing market

EU OBJECTIVES

Promotion of
sound
competition

Security of
Supply

Protection of
the
Environment

DIRECTIVE RES 2009/28/EC

Renewable Energy Sources

Heating &
Cooling

18.8%

Electricity

~5% (2011)

Transport

2.14%

CYPRUS
2011~

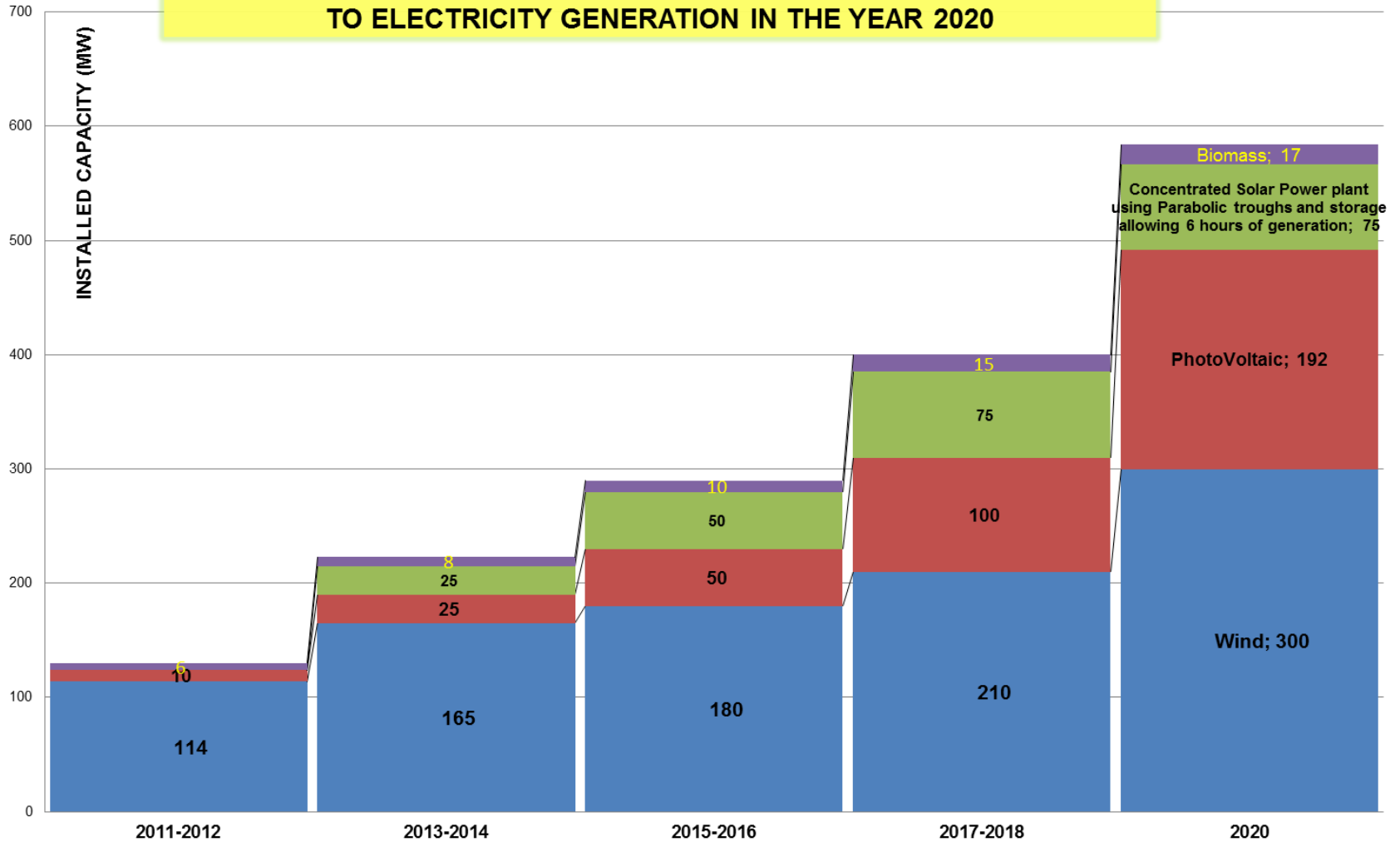
CYPRUS 2020

Mandatory
National Target

13%

NATIONAL STRATEGIC PLAN – 2020

SCENARIO FOR 16% PENETRATION OF RENEWABLE ENERGY SOURCES TO ELECTRICITY GENERATION IN THE YEAR 2020



- **Electricity Market**

- ▶ Achieve competition development within an economically viable and efficient energy market
- ▶ Achieve gradual penetration of RES in the energy mix/balance - 2020 targets

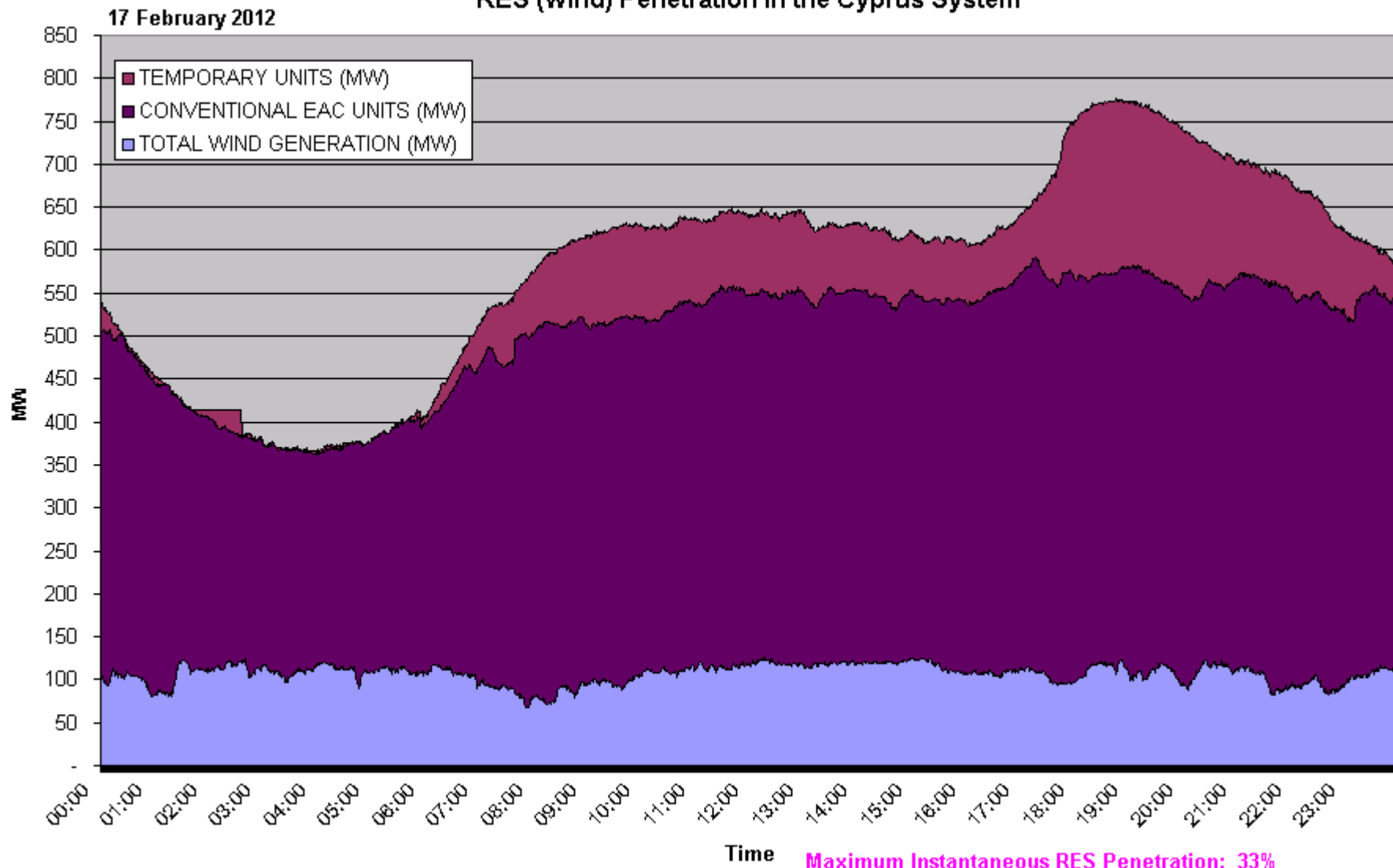
- **On Time Implementation of the Natural Gas Import for Power Generation**

RES-E PENETRATION CHALLENGES

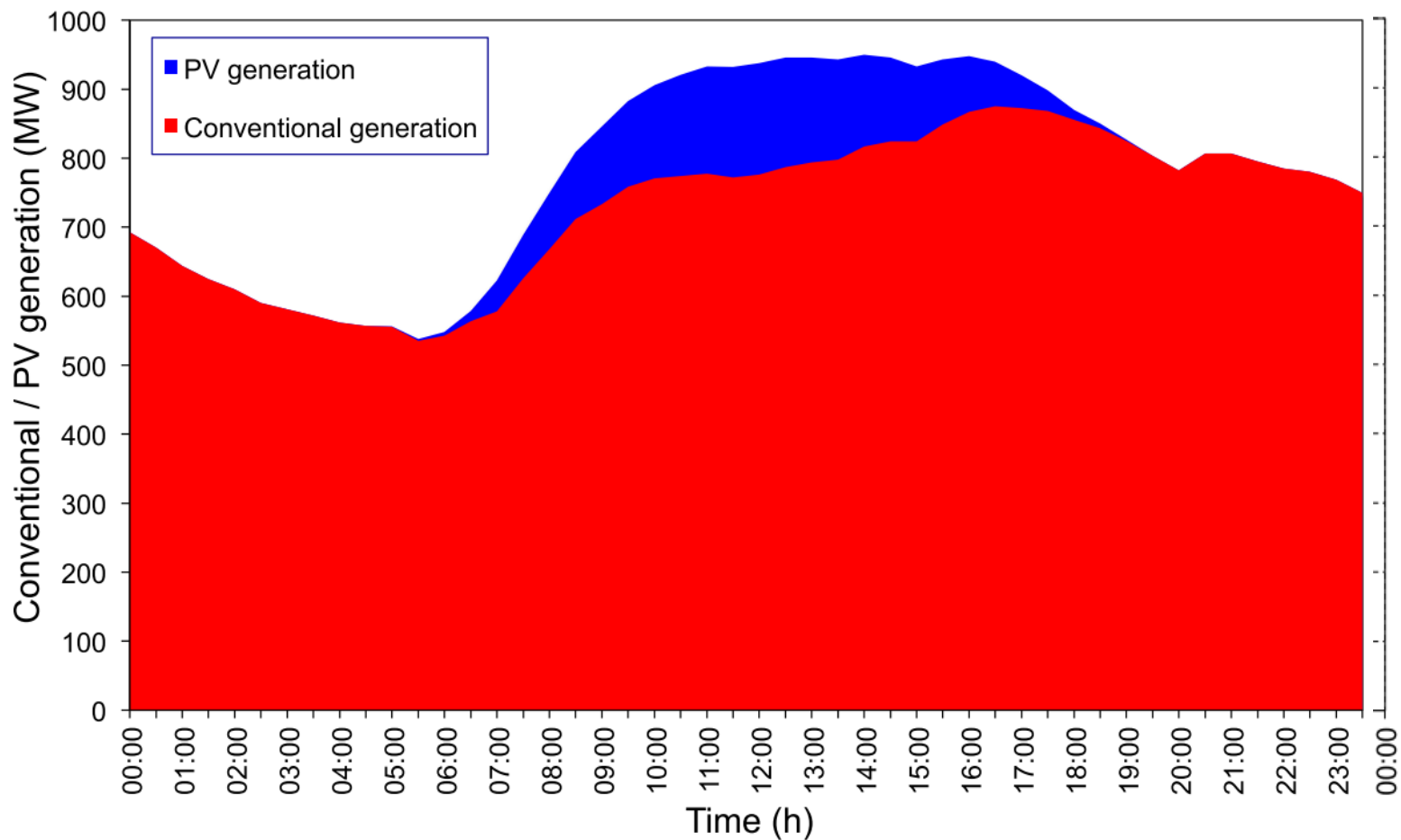
- ❖ **Technical – Intermittent nature of Operation**
Affects short –term secure operation of the small and isolated system
- ❖ **Financial– High Operational Cost**
Financially viable, sustainable and efficient energy Market
- ❖ **Commercial – Market Share**
Integration of RES production into the open Electricity Market avoiding distortions

SPECIAL DAY – HIGH WIND PENETRATION 33%

RES (Wind) Penetration in the Cyprus System



EXPLOIT PVs PRODUCTION CURVE - TYPICAL SUMMER DAY

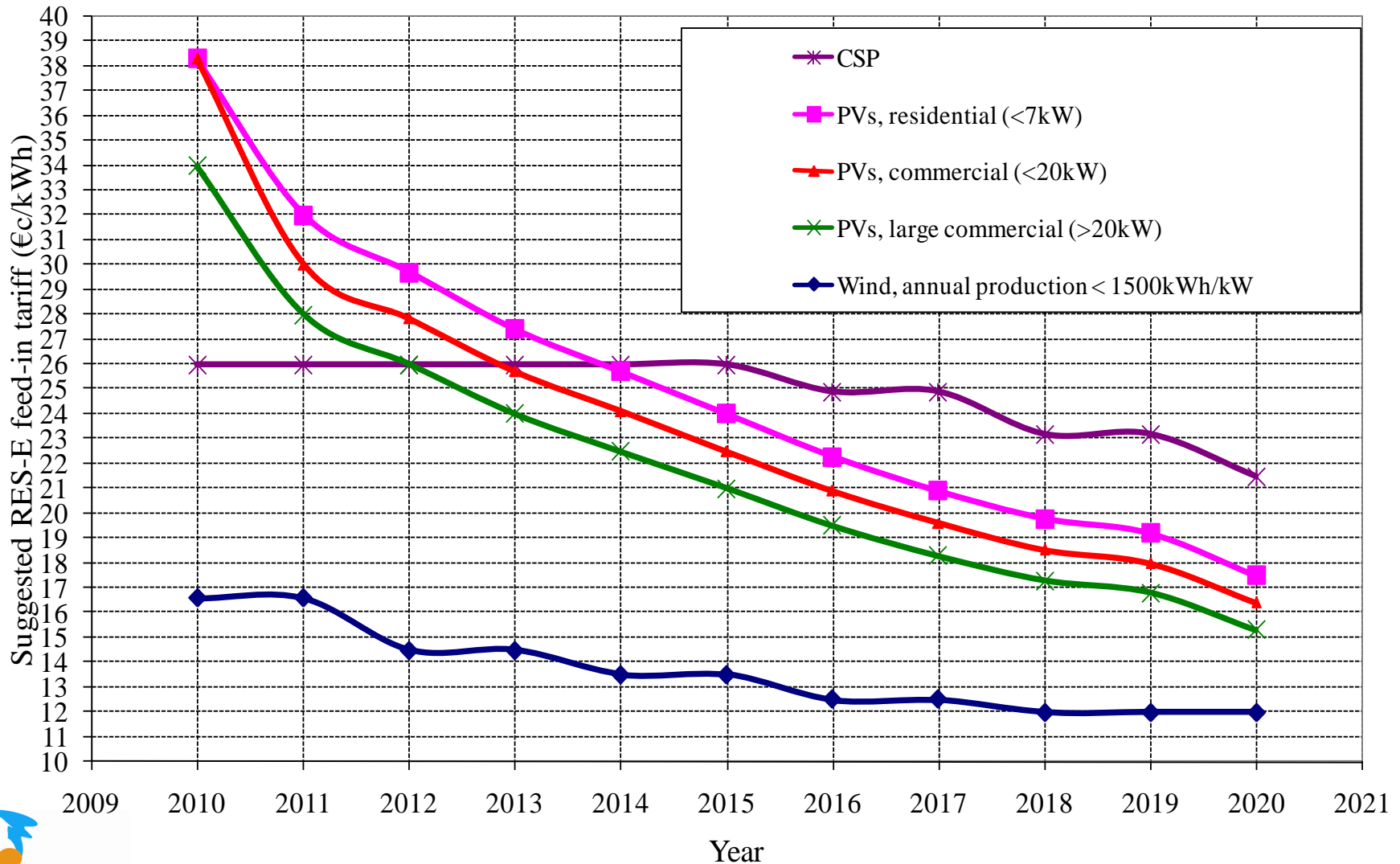


FACING ECONOMIC CHALLENGES

- ❖ Long term planning in accordance to Directive 2009/28 on the promotion of the use of energy from renewable sources
- ❖ Feed-in tariffs should reflect investment and O&M costs – Reduce or eliminate subsidies the soonest
- ❖ State intervention is still required (?) to achieve the binding targets
- ❖ Market based approach should be followed as much as possible

RES FEED IN TARIFFS REDUCTION PROPOSAL 2010

MARKET HAS BY FAR EXCEEDED CAPITAL COST REDUCTION



FACING COMMERCIAL CHALLENGES –

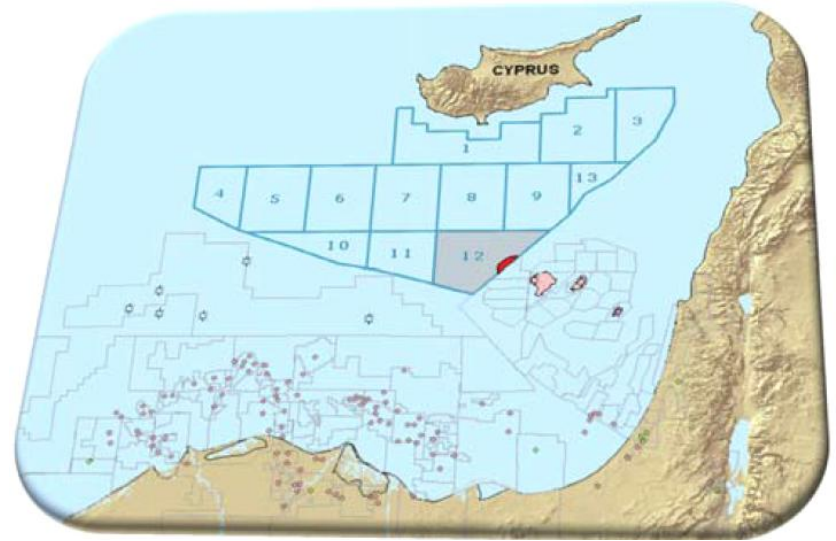
ELECTRICITY MARKET MODEL ISSUE

CERA has undertaken a study to re-examine the Electricity Market Model considering 3rd package and RES obligations in order to:

- ❖ evaluate the existing electricity market model and its suitability to support the electricity system of Cyprus**
- ❖ suggest improvements of the existing model or the adoption of a completely new market model**
- ❖ Main Goals of Study**
 - Competition**
 - RES Integration in Market**

NG SECTOR - EEZ DEVELOPMENTS

The discovery and exploitation of Natural Gas in the Exclusive Economic Zone gives Cyprus a potential never considered as possible before.

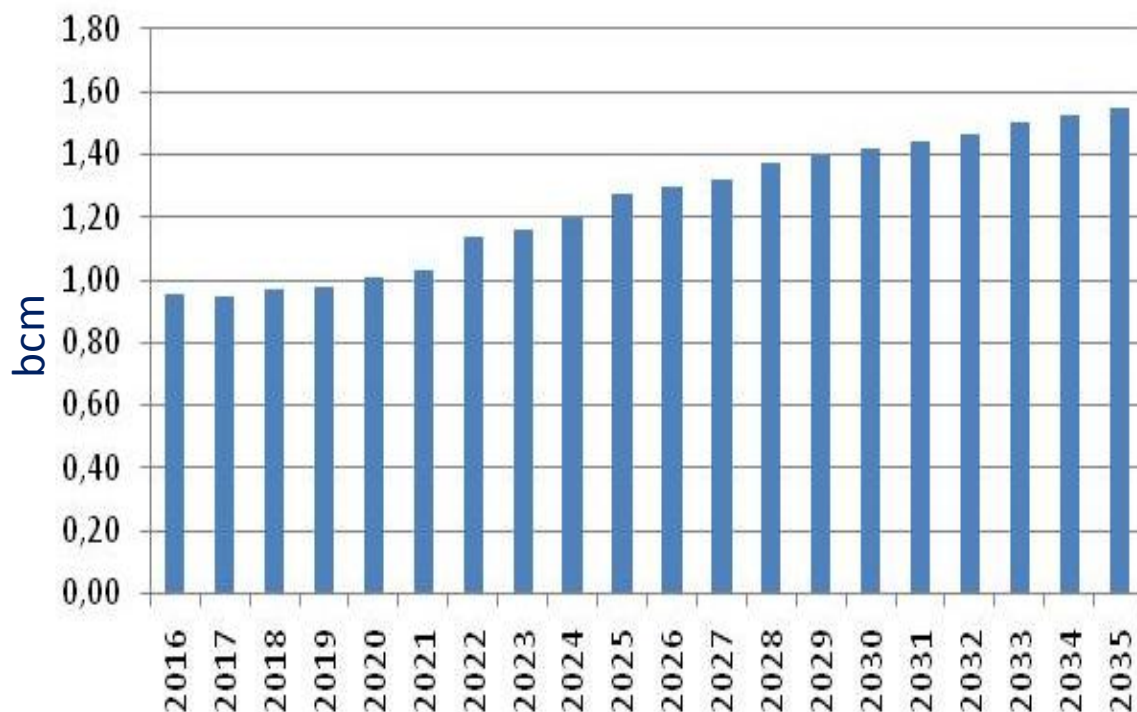


Thus, the establishment of a sound and solid **Energy Strategy** is essential.

It is imperative to ensure that all stakeholders cooperate in a spirit of openness, honesty and prudence in a transparent way.

NG SECTOR - CYPRUS ENERGY DATA

Natural Gas is not yet available in Cyprus

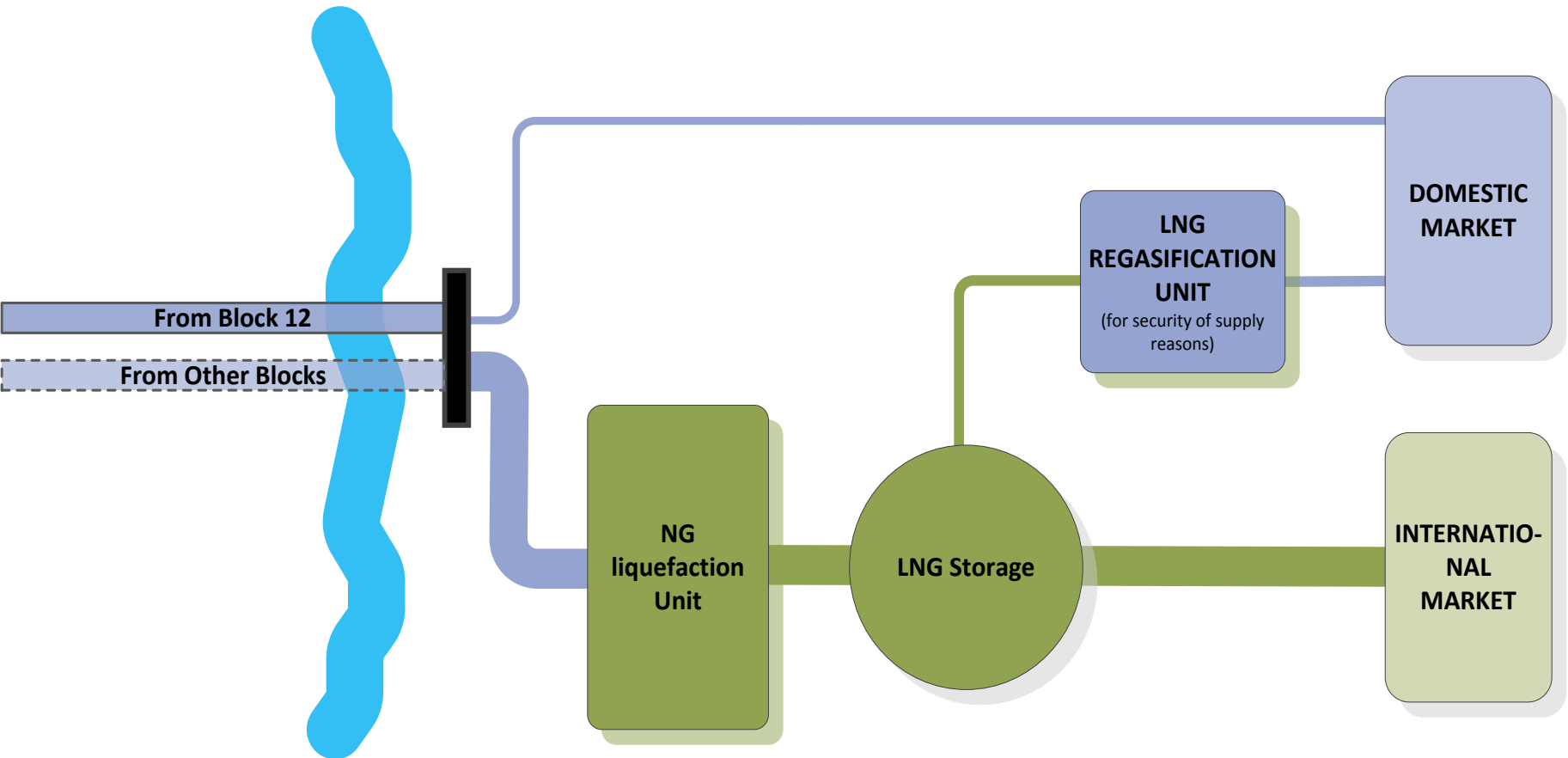


It is estimated that approximately 25 bcm of NG will be necessary for power generation purposes until the year 2035.

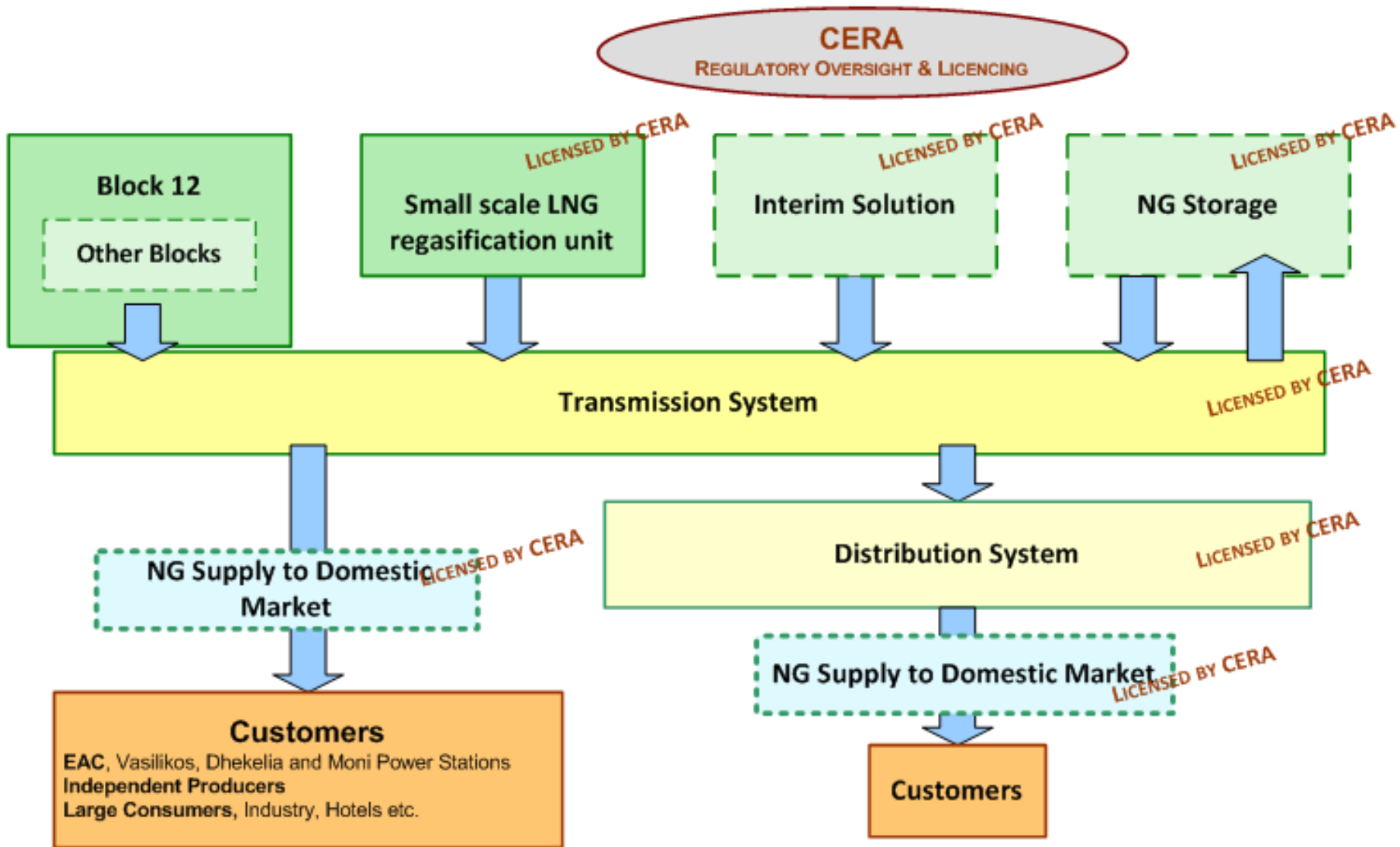
It is noted that the gross mean estimation for the deposit in Block 12 is 200bcm.

Consequently, large quantities of NG are available to be exported.

NG SYSTEM



NATURAL GAS DOMESTIC MARKET



CYPRUS POTENTIAL ROLE & PROBABLE PROJECTS

NORTH – SOUTH EAST ELECTRICITY



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- Natural Gas
- Electricity
- Electricity and natural gas
- Oil and natural gas
- Smart interconnected grids in the EU

COM(2011)658

Guidelines for trans-European energy infrastructure

Cyprus has been included in the electricity priority corridor and is mentioned in the North-South electricity interconnections in Central Eastern and South Eastern Europe («NSI East Electricity»).

It is related to interconnections and internal lines in North-South and East-West directions with a view to **completing the internal market and integrate generation from renewable energy sources.**

Member States concerned: Austria, Bulgaria, Czech Republic, Cyprus, Germany, Greece, Hungary, Italy, Poland, Romania, Slovakia, Slovenia.

MEETING WITH PUA & NGA, ISRAEL

SOUTHERN GAS CORRIDOR



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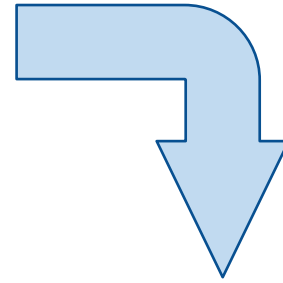
Cyprus has been included in the Southern Gas Corridor ("SGC") for the transmission of gas from the Caspian Basin, Central Asia, the Middle East and the Eastern Mediterranean Basin to the Union **to enhance diversification of gas supplies**

Member States concerned:

Austria, Bulgaria, Czech Republic, Cyprus, France, Germany, Hungary, Greece, Italy, Poland, Romania, Slovakia, Slovenia

CYPRUS LIQUEFACTION PLANT

Main Strategic Goal of Cyprus



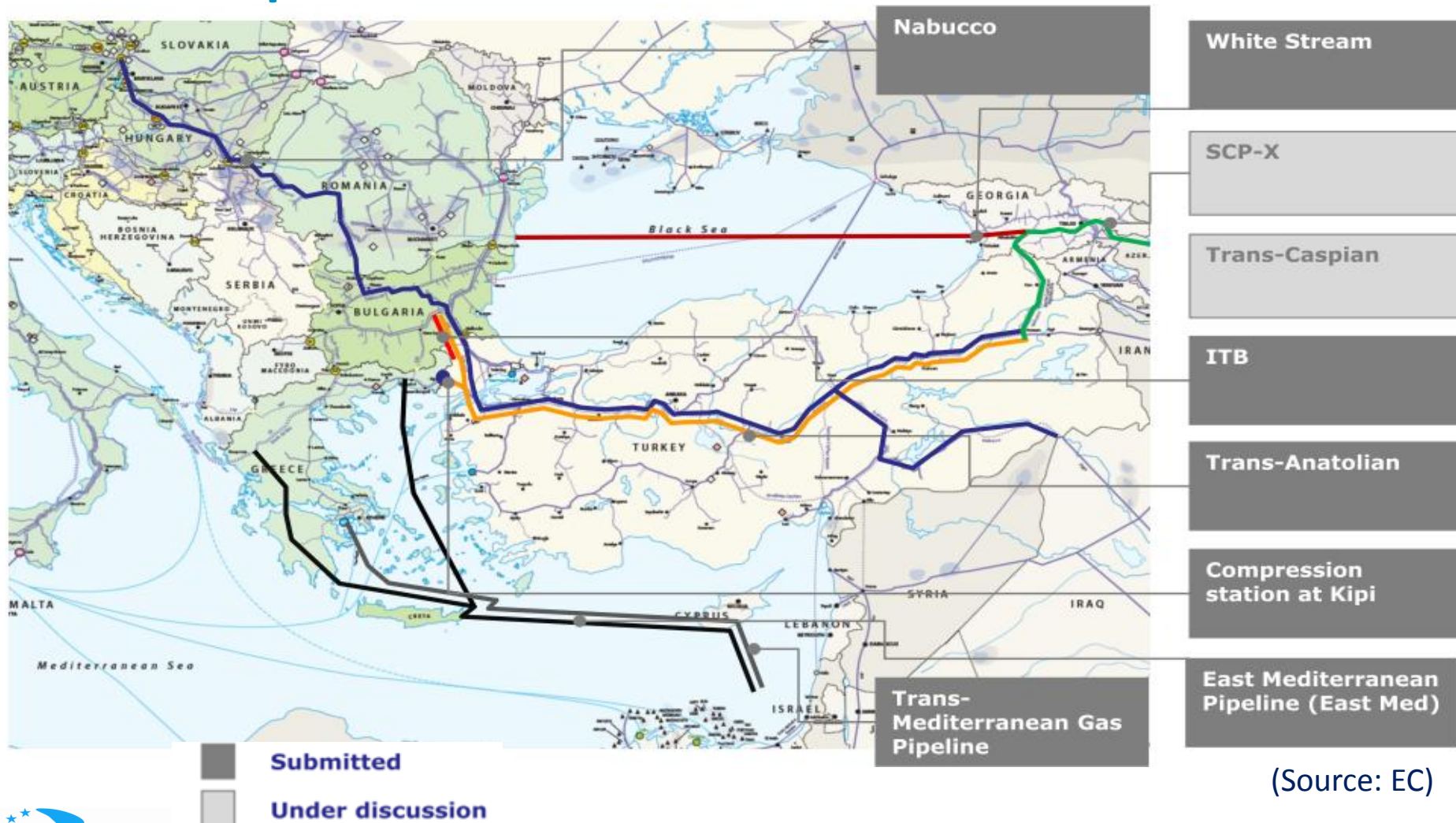
15 mtpa: 3 x 5 mtpa LNG Trains



- IN LINE TO EU POLICY
- Diversification of Energy Supply
- EU Security of Supply,
- Flexibility,
- Storage

EU SGC POTENTIAL PROJECT LIST

SE MED Pipeline



(Source: EC)

TRANSPORT OF EAST MED NATURAL GAS

Study undertaken by DEPA (Greece Public Gas Corporation)

- Technically feasible?
- Financially viable?
- Supports South - East Europe Market



GREECE – CYPRUS – ISRAEL ENERGY BRIDGE

The EuroAsia Interconnector is a proposed interconnector to connect Greek, Cypriot and Israeli power grids via an underwater power cable



Technically feasible? Financially viable?

It would contribute to enhance competitiveness, security of supply and RES integration & end isolation of the Island market

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Cyprus Energy Regulatory Authority
George Shammas
Chairman

**Thank you for your
attention**

Email: info@cera.org.cy website: www.cera.org.cy tel: +357 22666363