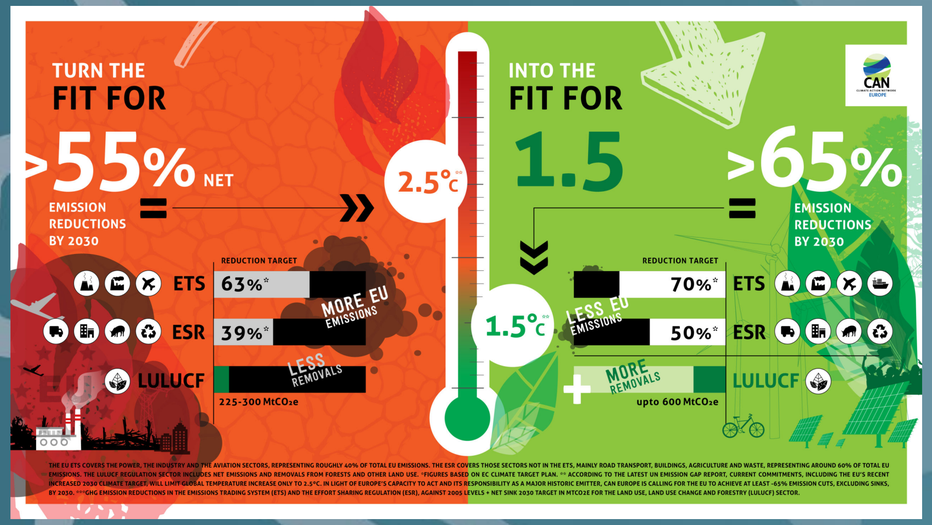
IRENA
International Renewable Energy Agency

LTES LONG-TERM SCENARIOS FOR THE ENERGY TRANSITION
AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL



LTES Webinars

Energy Planning towards zero emissions
the case of Cyprus

George Partasides
Energy Officer A'

Nov.2 /2011

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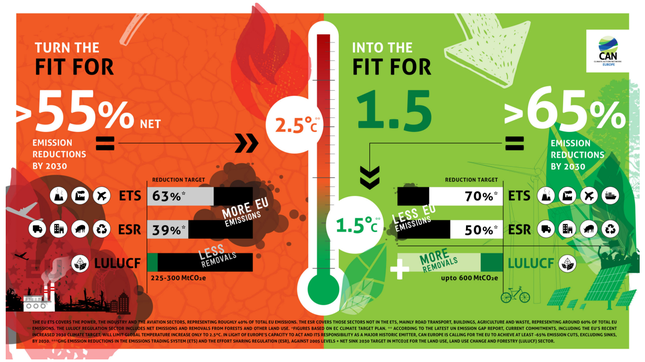
KNOWN YOUR SYSTEM

- Isolated power system (PCI Euroasia interconnector under Examination…)
- Very good solar resource (1700 MWh/MWp)
- Average (low) wind resource (1350 MWh/MW)
- High dependence on energy imports
- Strong grid

	STEAM	STEAM2	ICE	CCGT	GT
Unit power (MW)	130	60	16.7	220	37.5
No. of units	3	6	6	2	5
Fuel type	Heavy oil	Heavy oil	Heavy oil	Diesel	Diesel
Efficiency (%)	40%	31%	42%	50%	29%



Copyright PLATTS for the underlying grid; Copyright INEA - January 2015

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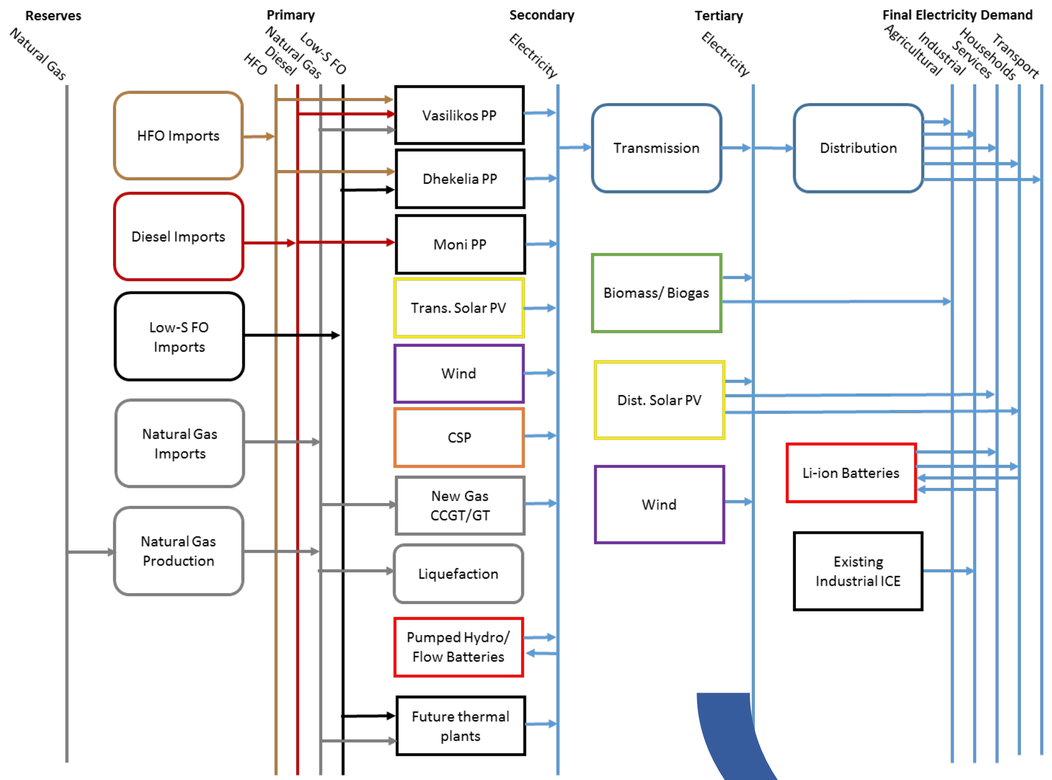
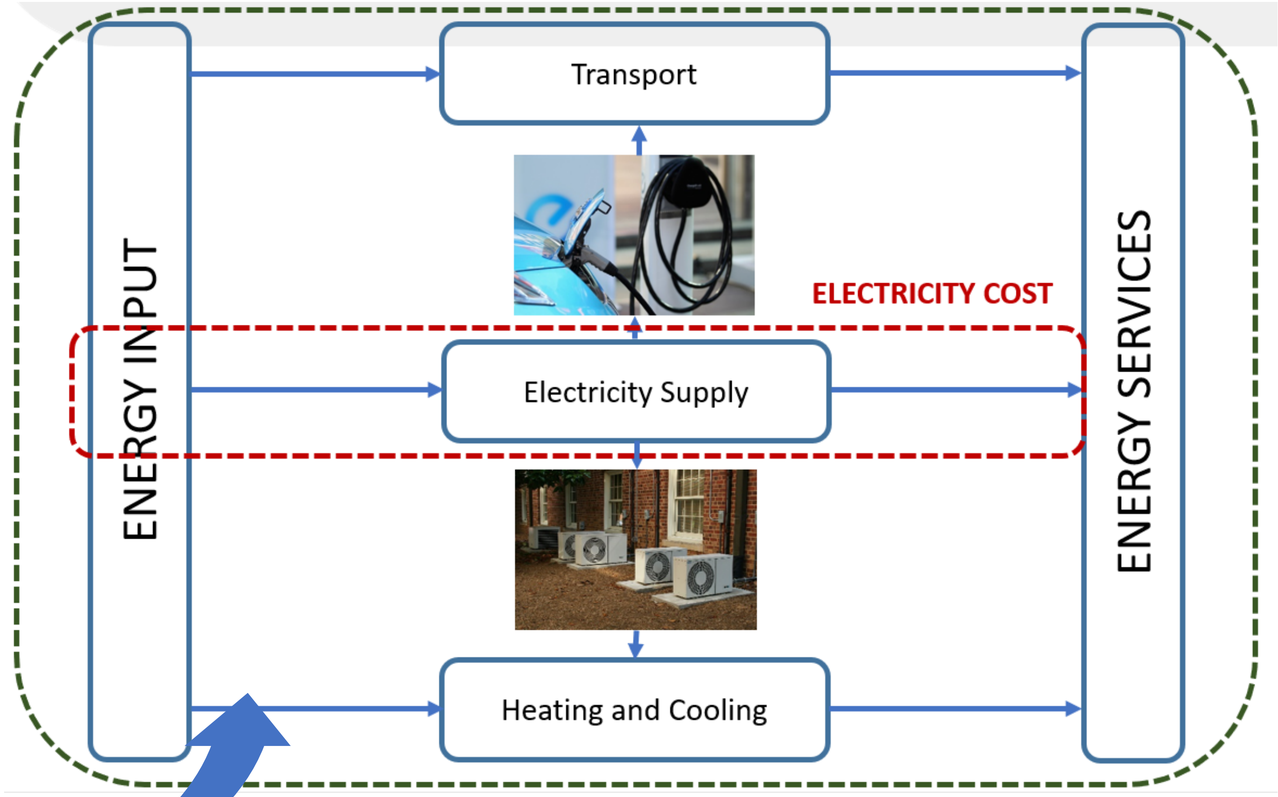
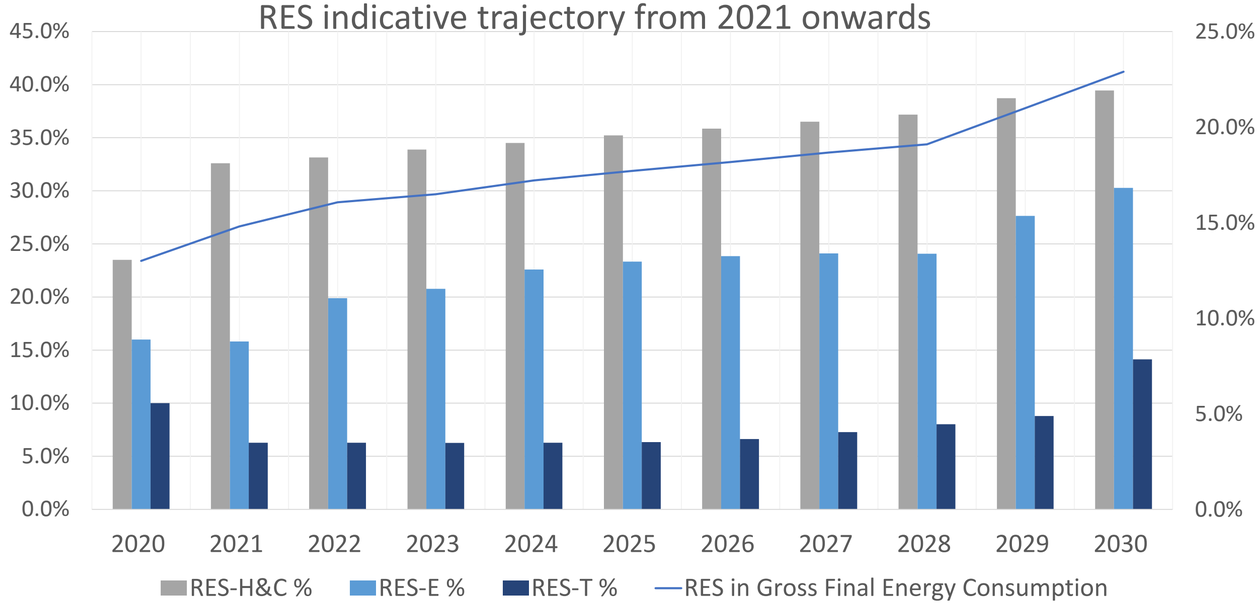
MODELLING: MESSAGE…..TO OSEMOSYS

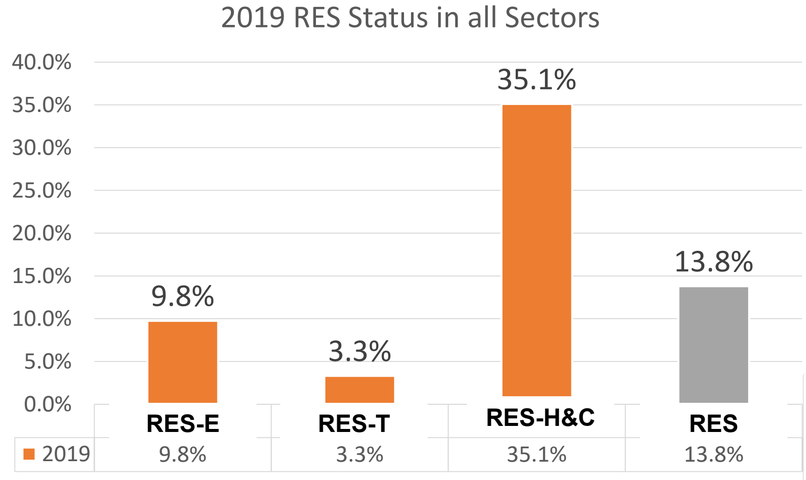


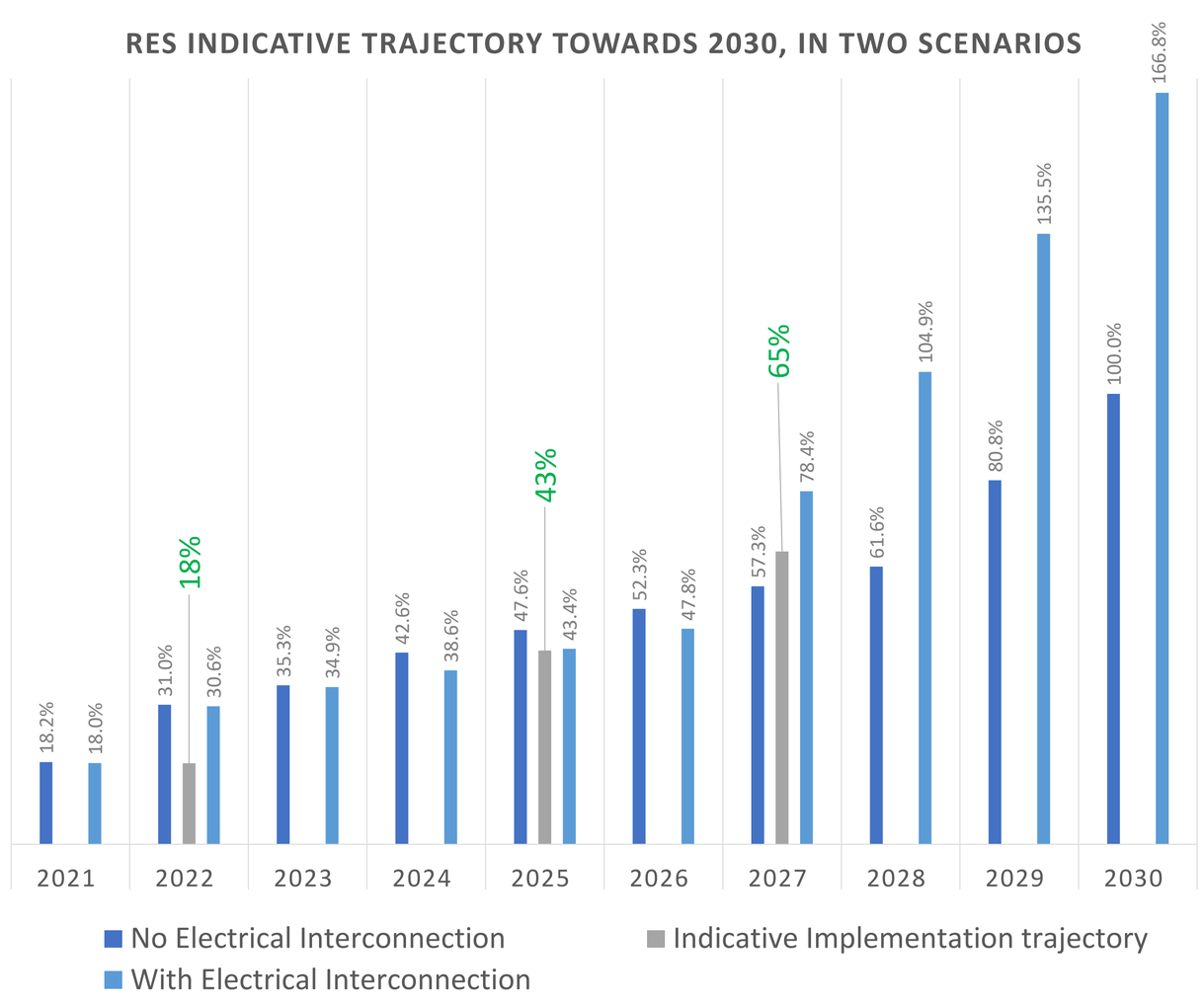


Optimization of the System Cost

RES Targets per Sector toward 2030







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VARIOUS STUDIES THAT WILL CONTRIBUTE TO CLIMATE NEUTRALITY

Rules and Policies for Heating and Cooling Networks
Report
Report for Structural Reform Support Service, SRSS (European Commission) and Ministry of Energy, Commerce, Industry and Tourism (MECIT)
SRSS/C2017/025

Development of a Heating and Cooling Strategy at Local Level (Cyprus)
Technical Assistance Report
Report for Structural Reform Support Service, SRSS (European Commission) and Ministry of Energy, Commerce, Industry and Tourism (MECIT)
SRSS/C2017/004

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Renewables and
ELECTRICITY STORAGE
A technology roadmap for REmap 2030

European Commission

Tender specifications
SRSS/C2017/011

«Preparation of technical specifications and a support scheme strategy for cogeneration units»

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Renewable Energy Roadmap
for the Republic of Cyprus

POWER SYSTEM FLEXIBILITY FOR THE ENERGY TRANSITION

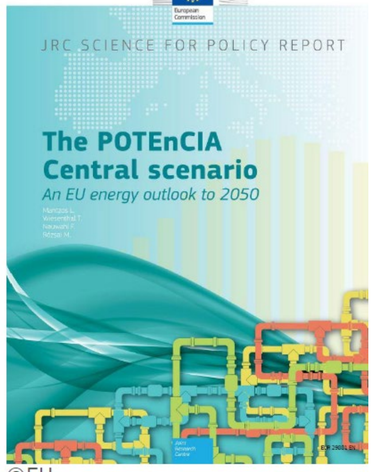
PART II:
IRENA FLEXTOOL METHODOLOGY

November 2018
www.irena.org

European Commission

JRC SCIENCE FOR POLICY REPORT

The POTEnCIA Central scenario
An EU energy outlook to 2050



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European Commission

JRC TECHNICAL REPORTS

JRC-IDEES: Integrated Database of the European Energy Sector

Methodological note

Authors:
Nijsen, L., Wiesenthal T., Mulet, N.A., Tchung-Ming, S., Rozsai, M.

With contributions from:
Ruiz, P., Soria Ramirez, A.

2017

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European Commission

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Renewable Energy Prospects for the European Union

European Commission

METIS Technical Note T3

Market module configuration for study S12

Focus on day-ahead, intraday and balancing markets

Artelys | OPTIMIZATION SOLUTIONS

THEMA CONSULTING GROUP

METIS Technical Notes
November 2016

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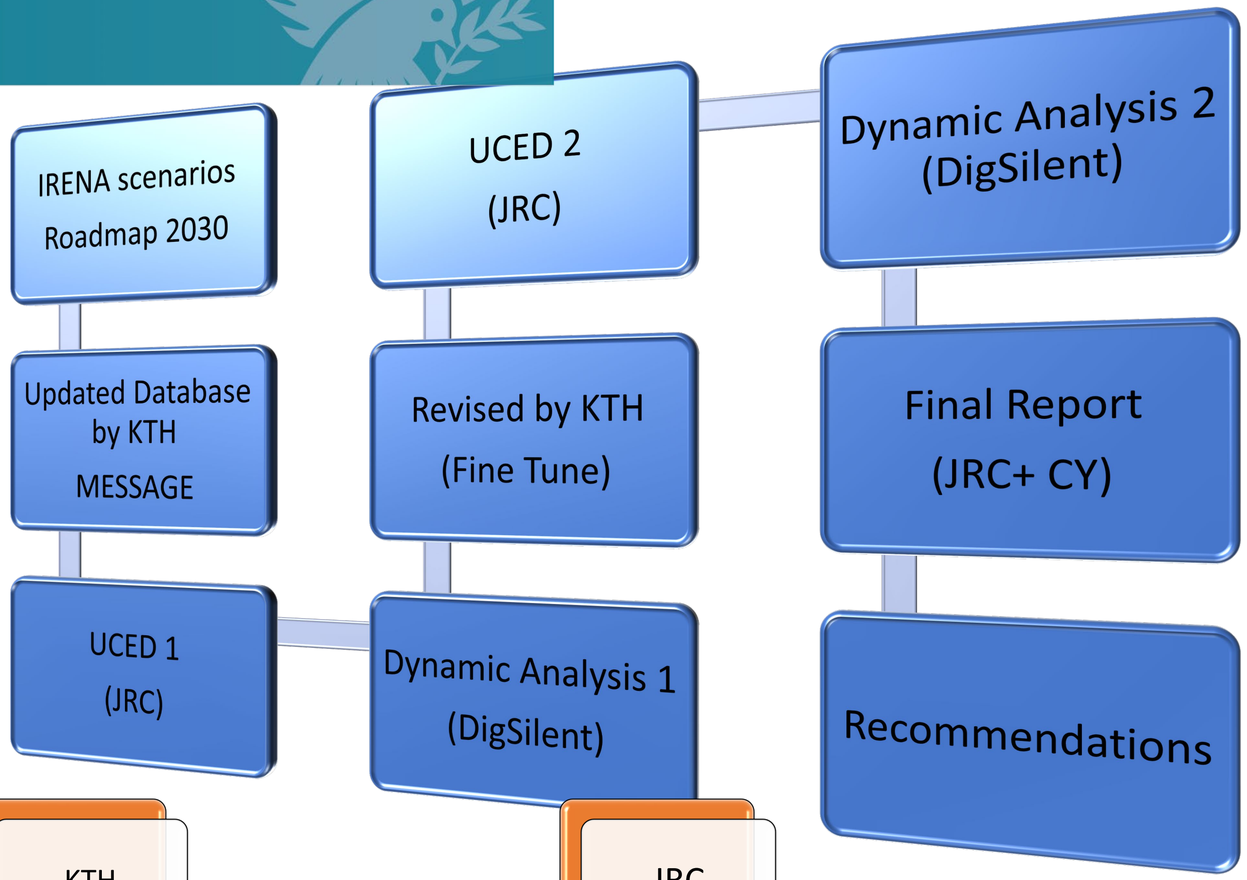
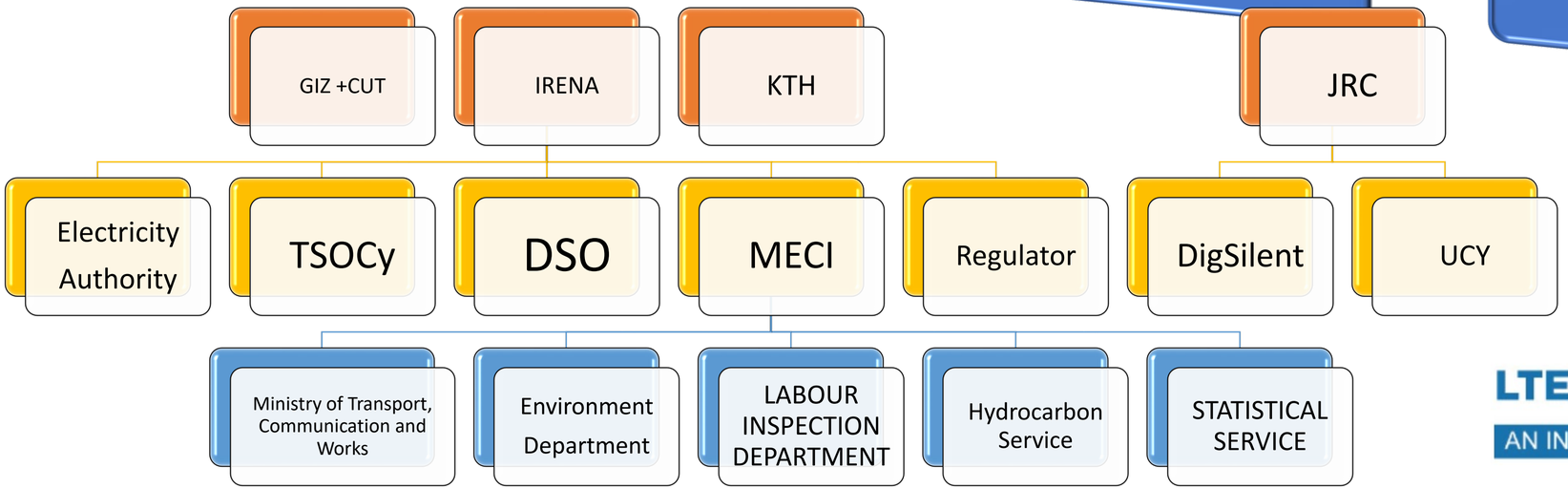
Methodology
Modelling Exercise



Stakeholders



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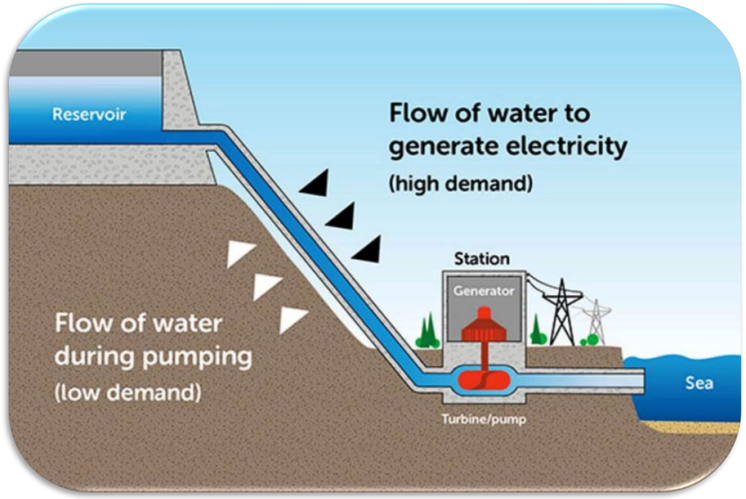
STORAGE OPTIONS (MECHANICAL – CHEMICAL – THERMAL)



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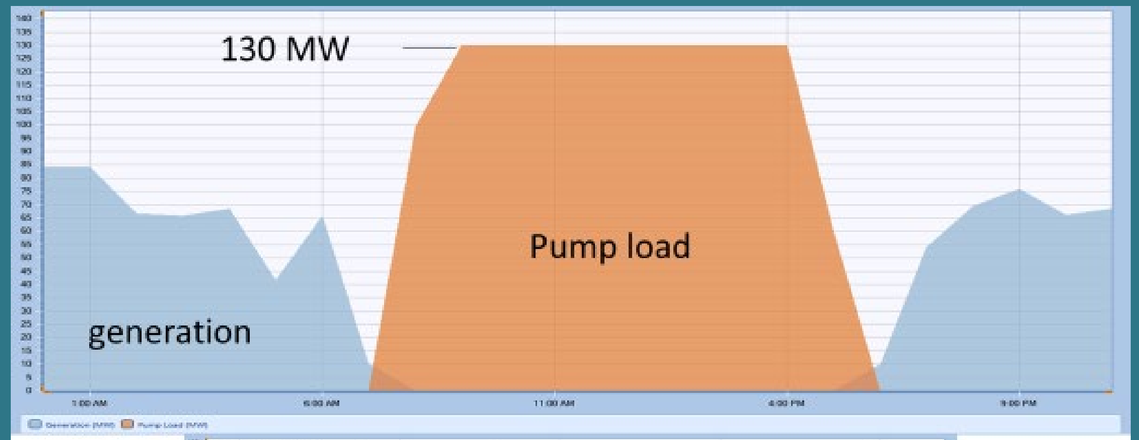
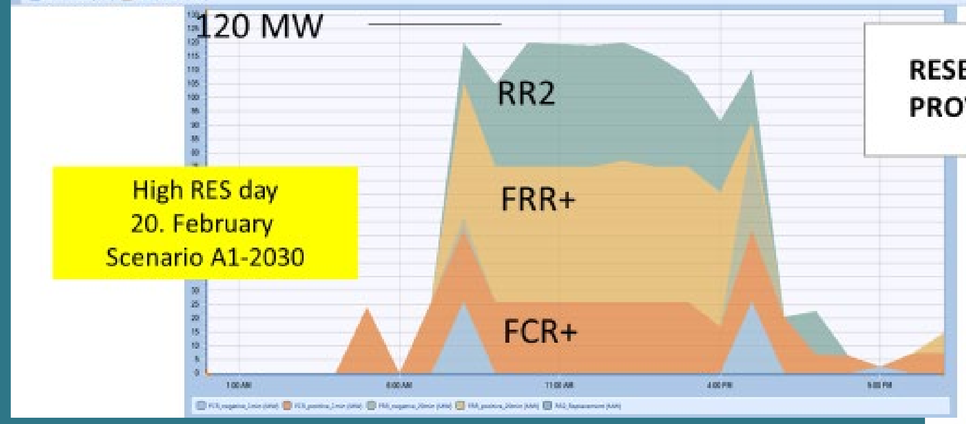
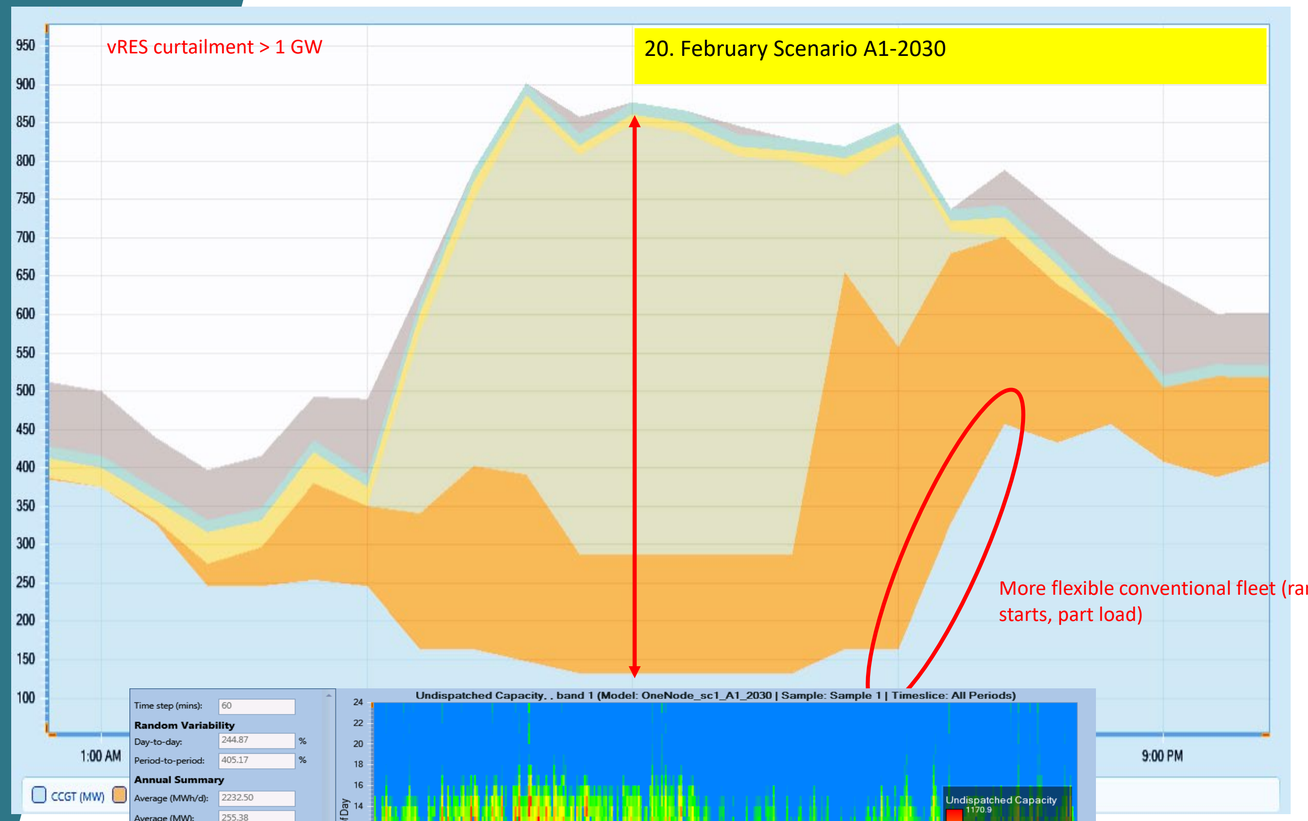
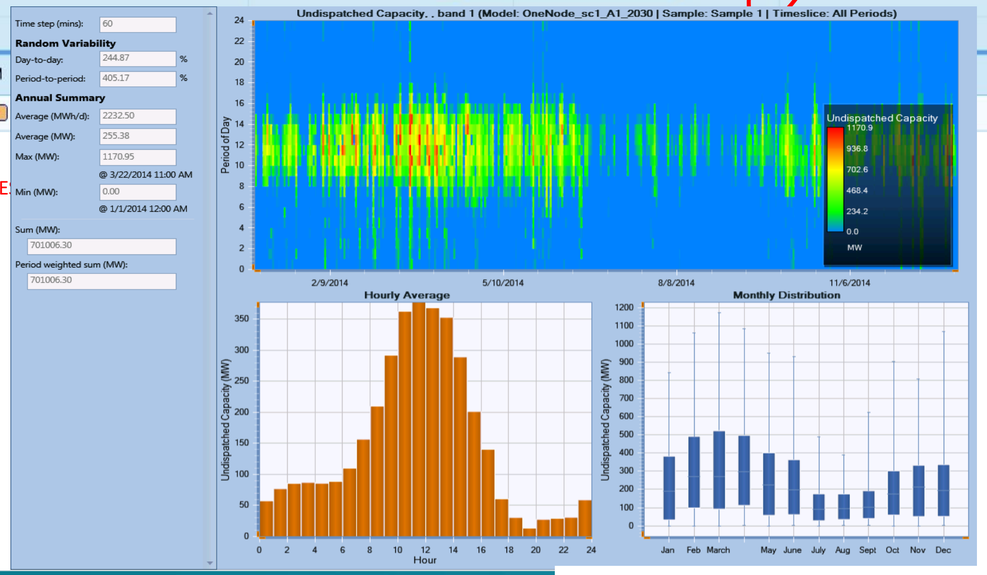
System Constraints: Secure the RES Penetration









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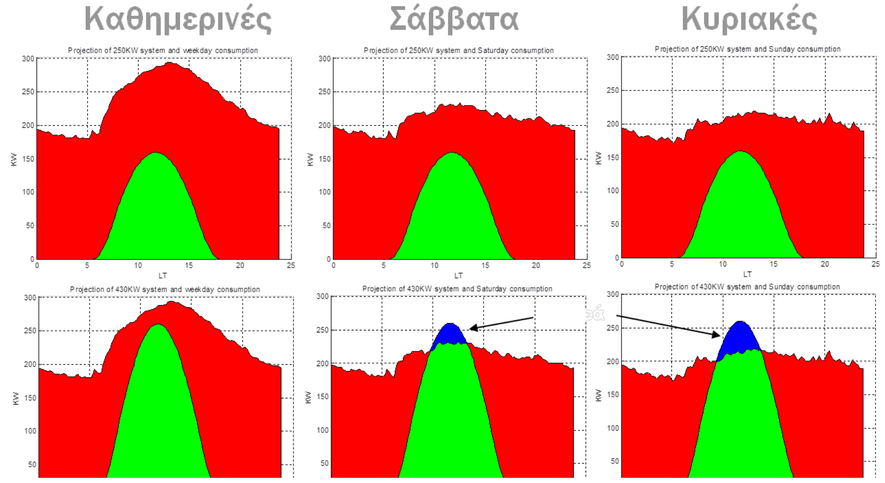
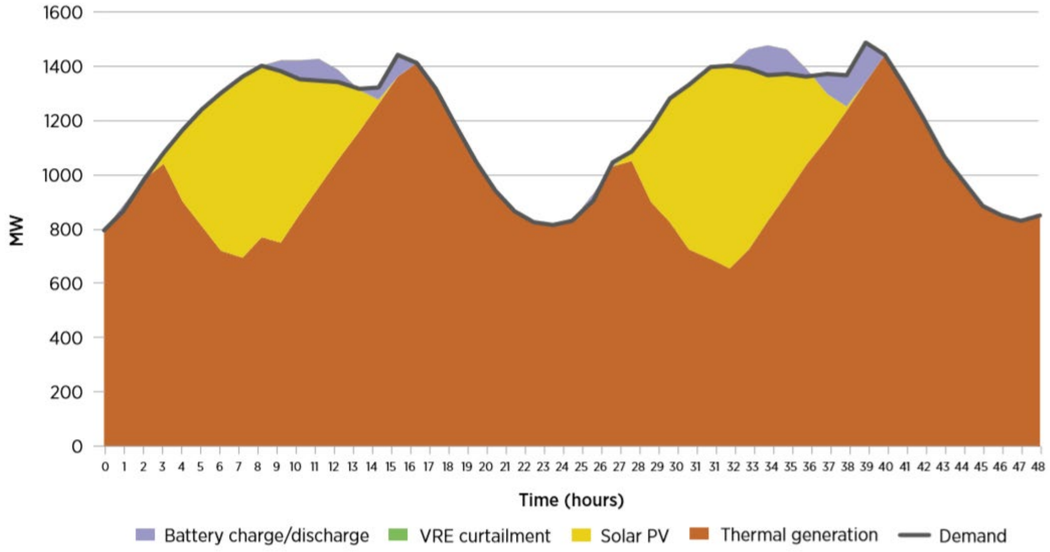
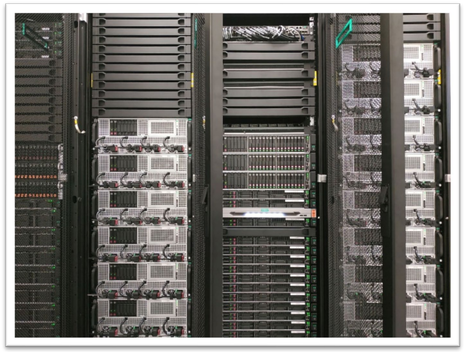
COMPLEMENT LONG TERM ENERGY STUDIES WITH DISPATCH MODELS

- Computational Power is very important (5-7 days to run a model on high-end specs desktop)
- Local Universities offer supercomputers
- Long Term Planning has to interact with “micro-level-planning”

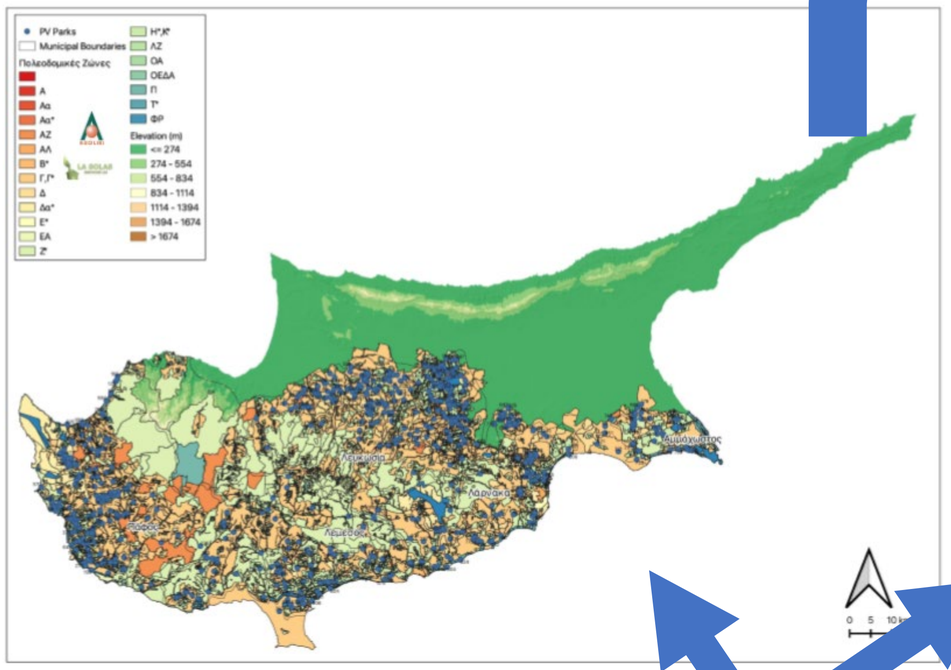


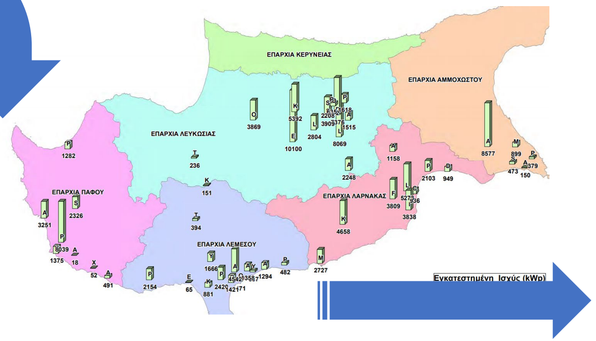


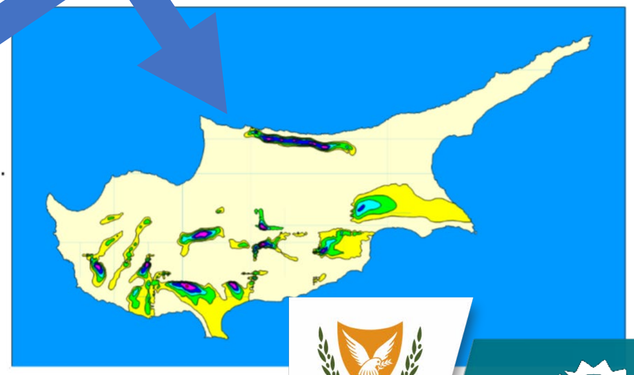


Cyclone Specifications

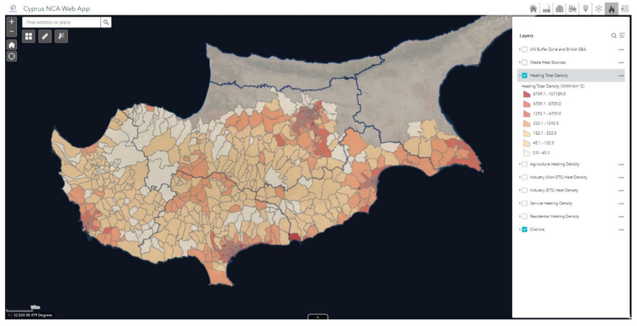
Peak/Sustained Performance	~600 TFlop/s
Number of Nodes	17 forty-core compute nodes 16 forty-core compute nodes, each with 4 NVidia V100 GPUs
Processors/node	2 twenty-core sockets per node, each is Intel Xeon Gold 6248
Memory/node	192 GB memory per compute node Approximately 5 TBytes system memory
Scratch disk storage	135 TB NVMe Storage
Disk storage	3.2 PB Storage
Node-node interconnect	HDR 100
accelerators	GPUs available
OS info	OS, Compute Node: CentOS OS, Front End & Service Nodes: CentOS







A2 Total Heating Density for Republic of Cyprus (excl. Sanitary Hot Water)



- Identify substation capacity
- Identify available lands and plots
- Technical Potential (Demand and Supply)
- Optimization per node using Advance tools (FlexTool or other Dispatch models)
- Correlation Map -> Signal to Investors
- Double Capacity with minimal Cost

OSeMOSYS
Open Source Energy Modelling System

IRENA FlexTool

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IMPACT ASSESSMENT METHODOLOGY

Income Group	Electricity	Heating Fuels (oil. LPG. biomass)	Transport Fuels (gasoline. diesel)	All Energy Goods
Poorest 10%	6.3	2.4	10.4	19.1
10%-20%	4.7	2.0	9.6	16.2
20%-30%	4.3	2.0	9.4	15.7
30%-40%	4.0	1.8	8.4	14.2
40%-50%	3.8	1.4	7.8	13.0
50%-60%	3.3	1.4	8.6	13.3
60%-70%	3.0	1.4	7.1	11.4
70%-80%	2.7	1.5	7.0	11.1
80%-90%	2.2	1.2	5.6	9.0
Richest 10%	1.8	1.0	3.5	6.3
All households	2.8	1.4	6.4	10.6

To assess the macroeconomic impacts of the scenarios, input-output (IO) analysis was applied

Change in economic output by main sector of the national economy of Cyprus due to investments in the different scenarios

Competitiveness Aspects

Socio-economic impacts

Expenditures of Cypriot households on energy goods

Thank you

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