MEDS
Energized by Low Carbon Technologies

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Developing a Net Zero strategy thanks to DECAPLAN™ Digital Platform

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Net Zero Meaning

Carbon neutrality is a state of net-zero carbon dioxide emissions. This can be achieved by balancing emissions of carbon dioxide with its removal (often through carbon offsetting) or by eliminating emissions from society.

The term is used in the context of carbon dioxide-releasing processes associated with transportation, energy production, agriculture, and industry.

The term "net zero" is increasingly used to describe a broader and more comprehensive **commitment to Decarbonisation** and climate action, moving beyond carbon neutrality by **including more activities** under the scope of indirect emissions, and often including a science-based target on emissions reduction, as opposed to relying solely on offsetting.


DECARBONIZATION & JOURNEY
to MEET PARIS 2050 AGREEMENT

WORLDWIDE CHALLENGE

Mission

Create a better planet by participating to the global net zero goal.

Vision

To be the global company offering
Customized Decarbonized Solutions
in Infrastructure and Industrial market segment

By helping our customers to achieve their commitment on net zero by 2030

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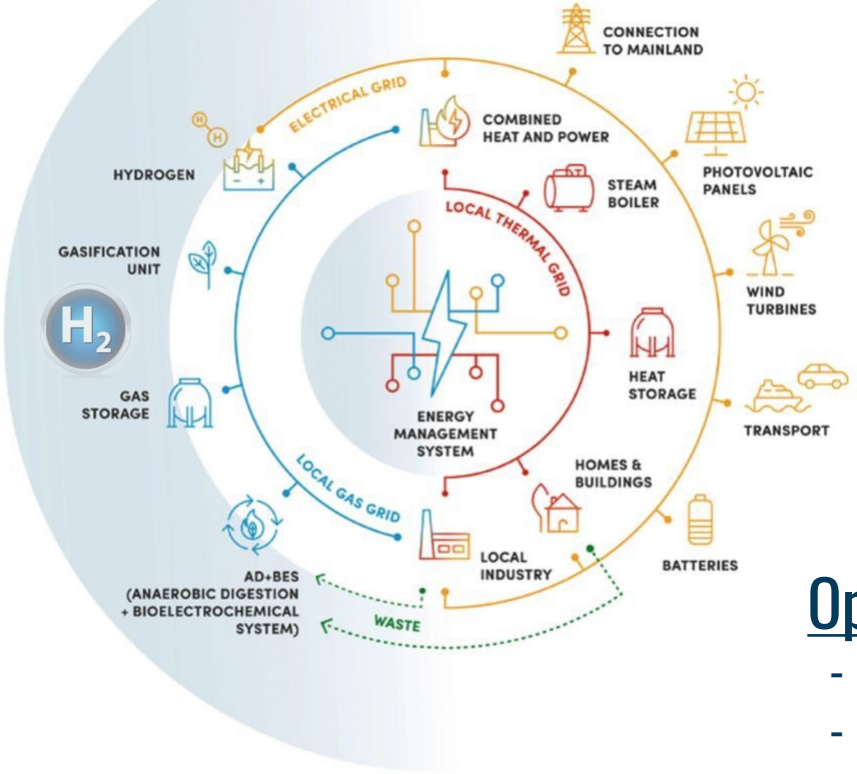
What a Net Zero Solution is aiming for?



Optimal Integration & Management of:

- Multi-Energy Supply & Demand
- Multi-Energy Storage Solution
- Multi-Fuels & Circular Economy

How to tackle the problem?

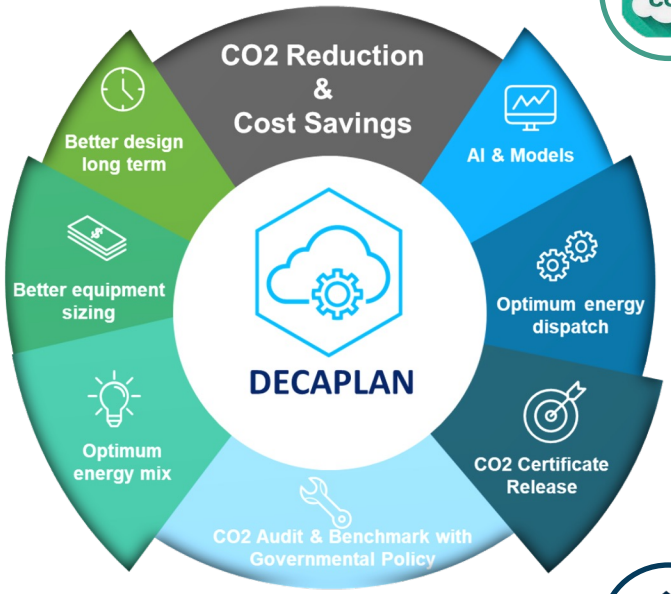
1- Renewable Energy:
- Solar PV farms & Rooftop utilization
- Off-shore Wind Farm
- Geo-Thermal

3 - Transportation:
- Electric Vehicles
- Smart & Efficient Transport

2 - Smart Control & Architecture:
- Optimized space for building & industrial sites;
- Smart BMS and Forecasting Operations based on AI&ML;
- Digitalization and Smart Control for reduced energy consumptions;

4 – Multi-Energy Efficiency & Novel Technologies
- Fuel Diversifications (H2, NH3,..)
- CCS & CCU
- Novel Storage Solutions
- Water Desalination
- Electrolysis & Fuel Cell
- CCGT & Novel Plant Layout

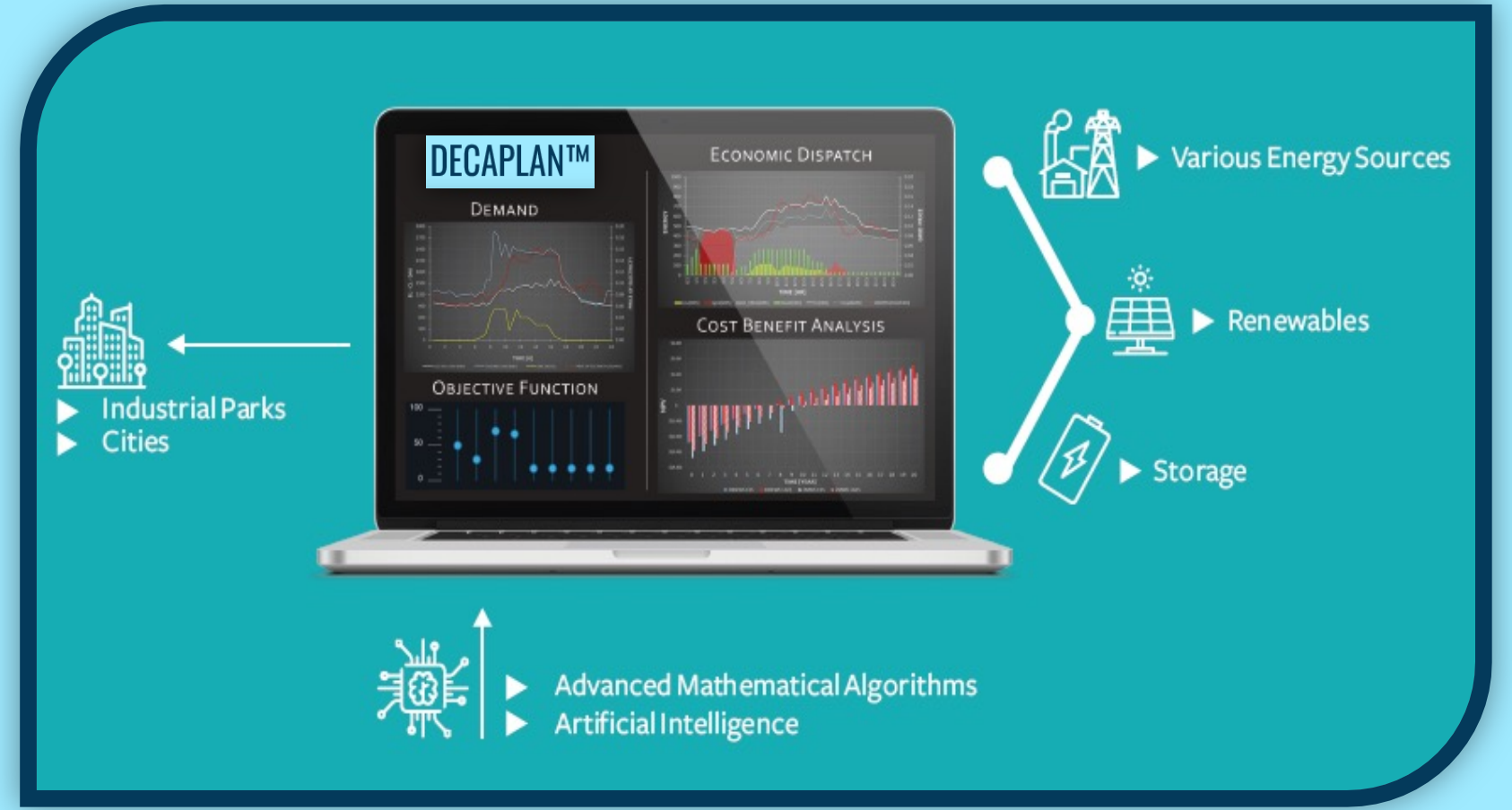
What can we achieve?



- 20% - 40% CO2 Emissions Reduction
- 20% - 50% CAPEX Reduction
- 10% - 30% OPEX Reduction
- UP to 30% Primary Energy Savings
- Reliable & Effective Multi-Energy Systems

DECAPLAN™ Digital Platform

Unique Digital Platform for Global Decarbonized Solutions



DECARBONIZATION & TECHNO-ECONOMIC FEASIBILTITY

Techno-Economic Challenges

- **CO2 Emissions Reduction** & **decarbonization cost**
- **CAPEX** during design & **OPEX** during operations
- Advanced **Maintenance**
- Long Term **Life Cycle Assessment** (LCA)
- Cybersecurity concerns
- **Circular Economy & Fuel Diversification strategy**
- **High uncertainty** in price variability and load demands

DECAPLAN™ relies on Advanced Algorithms and Artificial Intelligence

Integration and retrofitting of **renewable** energy, cogeneration technologies (CCHP, performance improvement) and **storage** (electrochemical, thermal, mechanical-optimal operations), optimal operations and optimal design

Integration of **Decarbonized Solutions** that includes also **fuel diversification** (H2, Biomass) and **Carbon Capture and Storage Solutions** (CCS & CCU)

Adoption of **multi-objective functions** (CAPEX, OPEX, NPV, ROI, CO2) enables the end-user to identify the **best possible solutions** matching the requirements, based on **Artificial Intelligence & Machine Learning Techniques**

CO2 Validation and Certification for compliancy with regulation (i.e. ***VERRA***)

DECAPLAN™ Digital Platform: a Novel Approach

D-Assessment of:
- Energy Assets
- Thermal and Electrical consumption
- Carbon emission

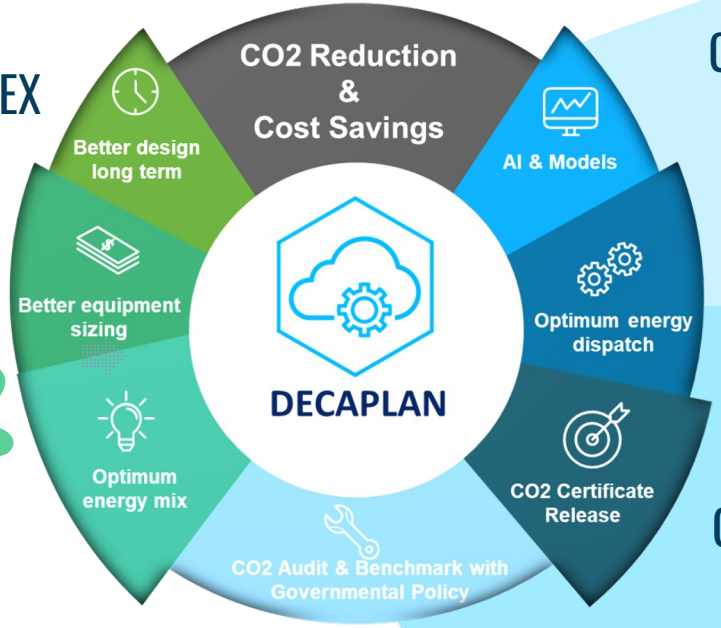
Master-Planning for Greenfield & Brownfield Projects through Advanced Algorithms

Optimized Real-Time Economic Dispatch based on Advanced AI & ML Solutions Carbon Off-set

Carbon Certification of the overall System through our partner

EVERCOMM

CO2 & CAPEX

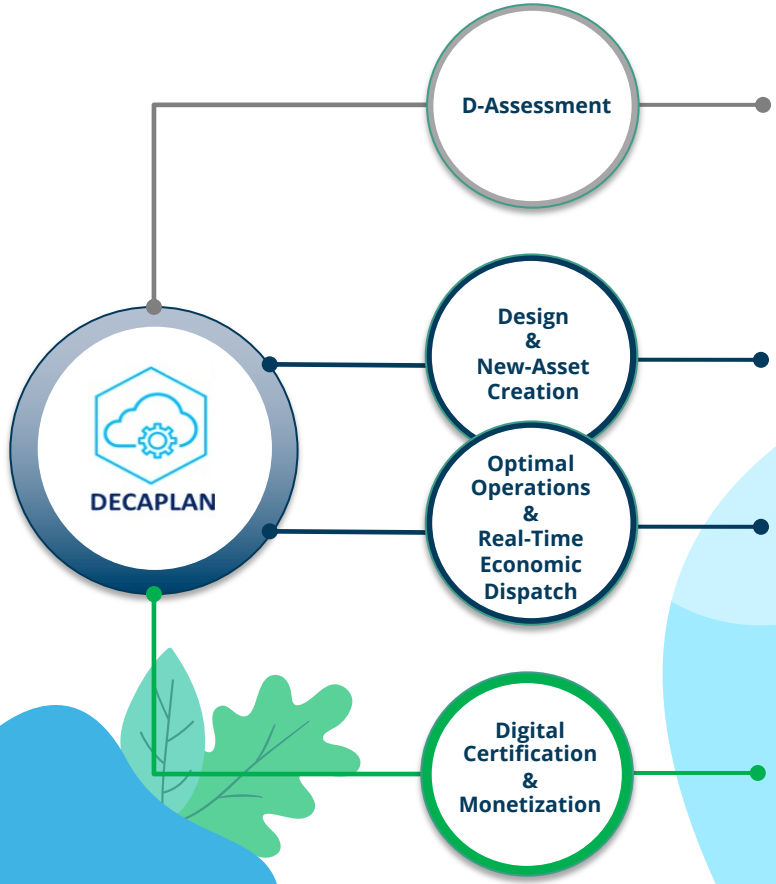


COMPLIANCY with REGULATION

CO2 & OPEX

BUREAU VERITAS 1828
BUREAU VERITAS

DECAPLAN™ Digital Platform: the structure



- **Data Analytics** & **Assessment** for Energy, Cost and CO2 footprint
  - **In-Depth** Analytic & **D**ecarbonized approach for **baselining and certification**

- **Optimized CAPEX** and **CO2 reduction** for Greenfield and Brownfield Projects:
  - **Integration** of **Renewable**, CCHP and **Energy Storage** with advanced solutions (**H2**, Biomass, CCS and CCU) & **Fuel Diversification**;
  - Selection of **commercially available equipment**, relying on **DECAPLAN™** regularly updated equipment **Data Base**

- **Optimized OPEX** and **CO2 Reduction** during plant operations
  - **Unit Commitment** & **Optimal Dispatch** problem solving for multi-energy systems

- **Artificial Intelligence & Machine Learning** algorithms for:
  - **load demands** and boundary conditions **forecasting**
  - **Real-Time Optimization demands** and boundary conditions **forecasting**;

- **Monitor & Benchmark of CO2 emissions** towards D-Assessment CO2 baseline;
- **Carbon Certificates** following **VERRA** standards through our partnership with EverComm
- **Carbon Trade Ready Platform….**

DECAPLAN™ Case Study #1

Deployment of COGEN Plant in a Port Estate in APAC

Case Study: Brownfield Project in the Green Port Scenario

Cooling demand to be satisfied

The main driver for the sizing and design of the Cogen plant is that of satisfying the entire cooling demand of the end-customer

Thanks to advanced design the **DECAPLAN™** software enabled to achieve:

- **30% CAPEX reduction [~ $800,000]**
- **10% Primary Energy Savings**
- **12% CO2 Emission Reduction**
- **70% Time savings**

Cogen Plant

Natural Gas

Waste heat

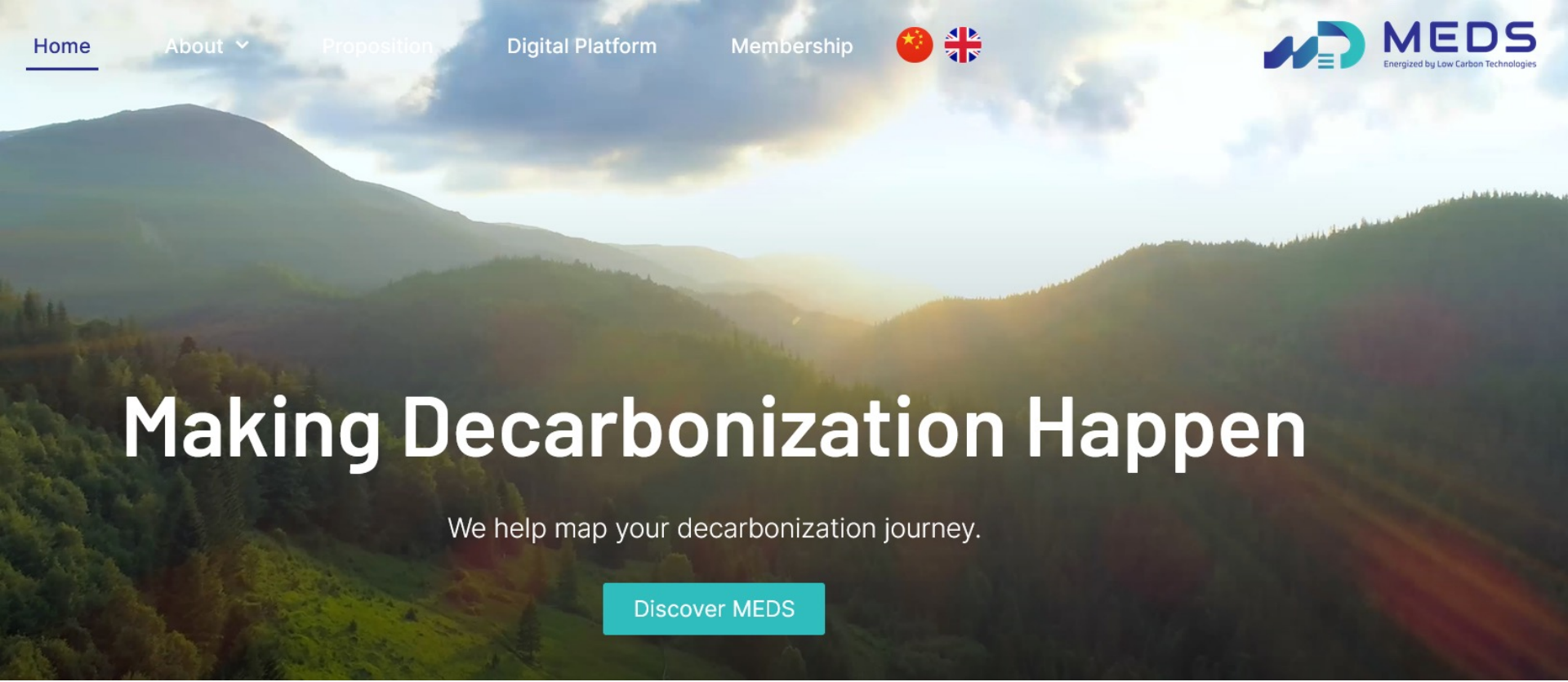
Chilled water

	Engine	Abs. Ch. Cooling Tower	Thermal Storage	Overall	Primary Energy (Natural Gas)	Time to achieve final design solution
Bidder in tender	$ 1.4M	$ 1.1M	$ 600K	$ 3.1M		
Sizes	990kW	300 RT	500 RTh		16786 MWh	5 Weeks
Savings obtained thanks through WP1 software	-15%	-30%	- 46%	- 30%	- 18%	- 70%
Sizes	800kW	230 RT	230 RTh		13797 MWh	1.5 Weeks
DECAPLAN™	$ 1.2M	$ 760K	$ 320K	$ 2.28M		

The bidder sized the Cogen Plant to satisfy the whole cooling load for the end-customer without considering existing chillers and assets available

- **Oversizing of components**
- **Large incurred costs (CAPEX, OPEX)**
- **Sub-optimum operation of selected components**

Thanks to DECAPLAN™, optimized sizing and selection based on economic dispatch and CO2 emission reduction can be achieved



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Thank you ☺

www.medsventure.com