49th ASECAP DAYS

Decarbonizing Road Infrastructure : Challenges, Perspectives and Actions in Tough Economy

ASECAP DAYS
BRUSSELS 2022

Hotel Marriott Grand Place, Brussels

24 – 25 November 2022

ASECAP DAYS

BRUSSELS 2022

Decarbonizing Road Infrastructure

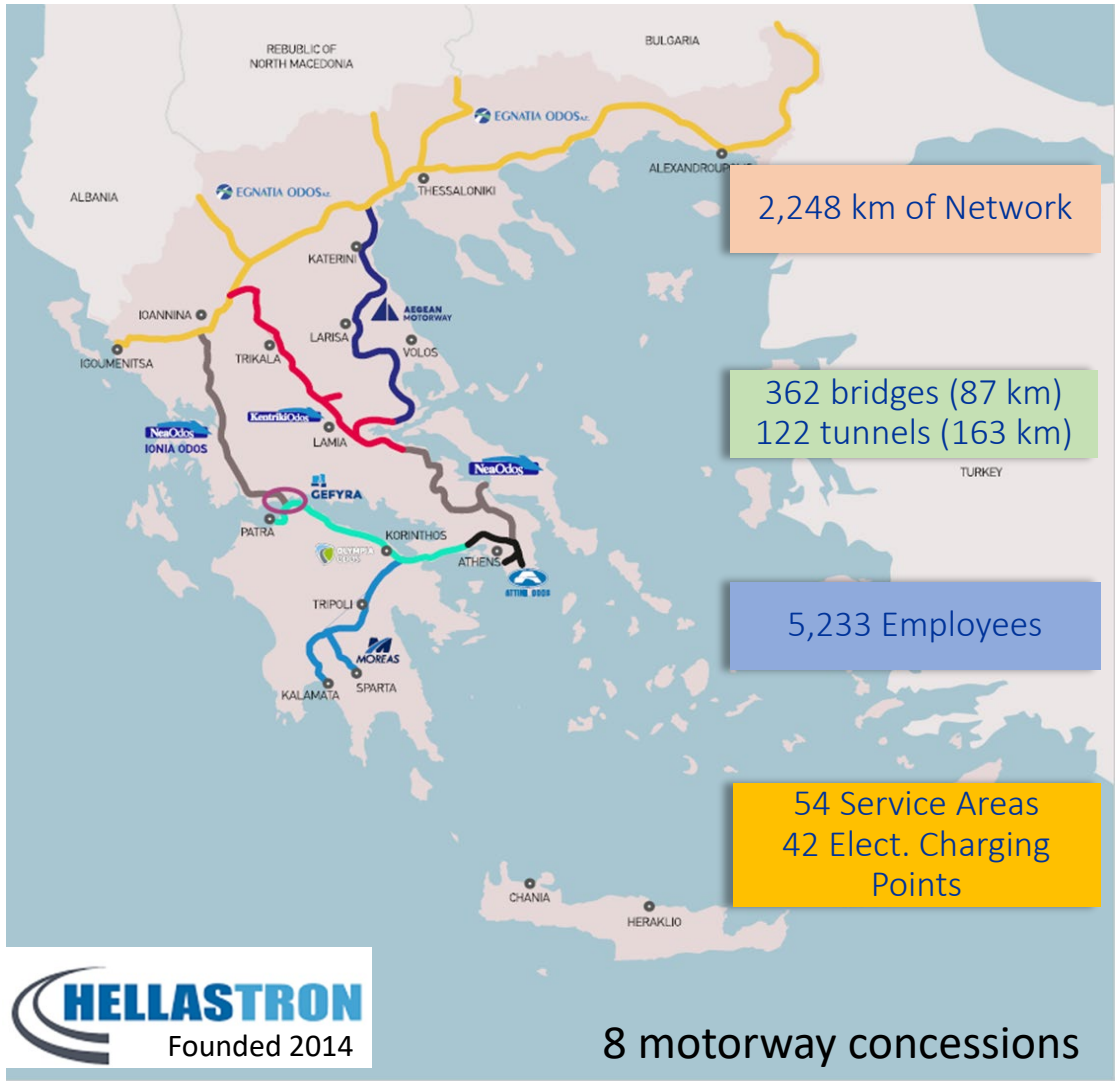
- The Approach of Greek Motorways -

Dimitrios Gatsonis, CEO
Aegean Motorway S.A.
Hellastron/Head of Sustainability Taskforce

HELLASTRON

Contents

Hellastron



4

ENVIRONMENTAL & CLIMATE CHANGE MANAGEMENT

3

CORPORATE RESPONSIBILITY

2

COMPLIANCE WITH NATIONAL AND INTERNATIONAL LAW

1

CONTINUOUS IMPROVEMENT OF ROAD SAFETY & SERVICES

Introduction

EU Climate Policy and Green Deal

Spring 2021

- 55% reduction in greenhouse gas emissions by 2030 compared to 1990 levels.
- EU become the first climate-neutral continent by 2050.
- Key targets for 2030
  - At least 40% cuts in greenhouse gas emissions (from 1990 levels)
  - At least 32% share for renewable energy
  - At least 32.5% improvement in energy efficiency

Egypt, November 2022

COP27 goals:

- **Mitigation**: keep the 1.5 degrees global warming target, compared with pre-industrial levels
- **Adaptation**: witness an enhanced global agenda for action on adaptation
- **Finance**: review progress on the delivery of USD 100 billion per year by 2025 to help developing countries deal with the adverse effects of climate change
- **Collaboration**: ensure adequate representation from all relevant stakeholders in COP27, especially vulnerable communities

Greek Climate Law/ key milestones

2022

2022, 27 May

Establishment of the National Climate Law

2023

Annual Carbon Footprint Report against GHG Pr or ISO 14064/ Mandatory Assurance

New Buildings: 30% of total electricity supply must cover by Photovoltaic Panels

2024

25% of new company cars must be hybrid/electric

2025

Abolishment of oil powered boilers.

2028

Abolishment of lignite.

2030

30% reduction of emissions for activities which require Environment Impact Study (category A, law 4014/2011) compared to 2019 levels

55% reduction of net anthropogenic greenhouse gases emissions in comparison to 2019 levels

All new cars must be Renewable

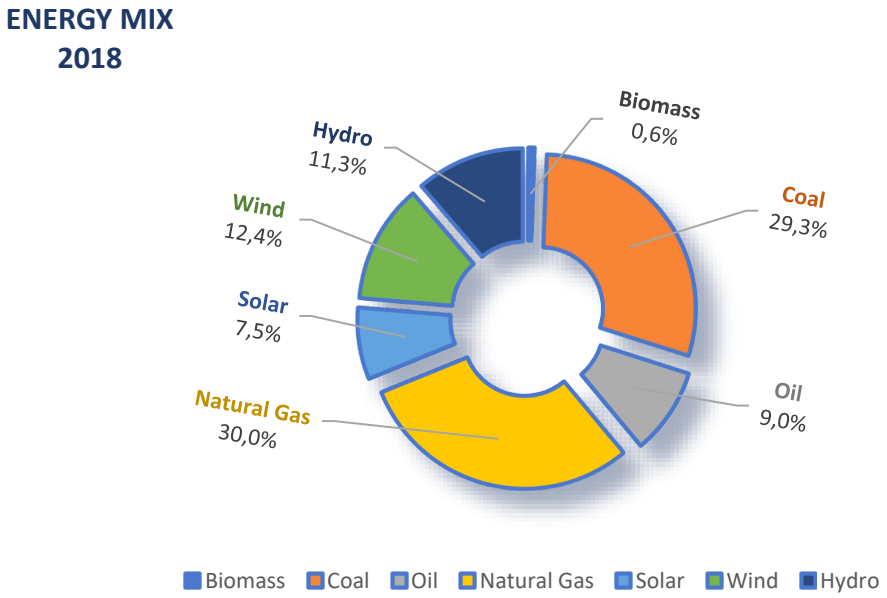
2040

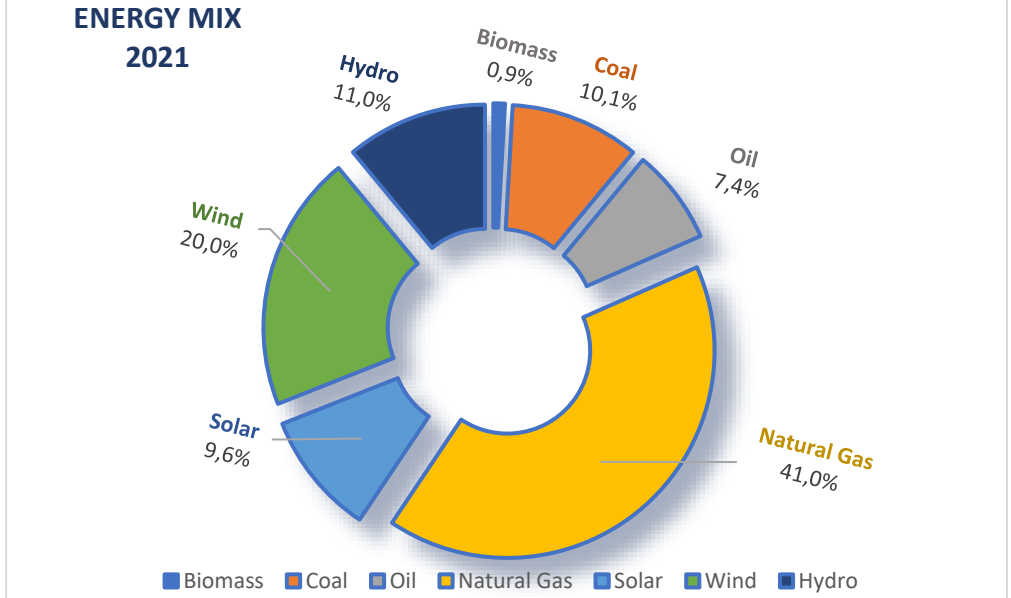
80% reduction of net anthropogenic greenhouse gases emissions in comparison to 2019 levels

2050

Climate Neutrality!

Energy Mix Greece



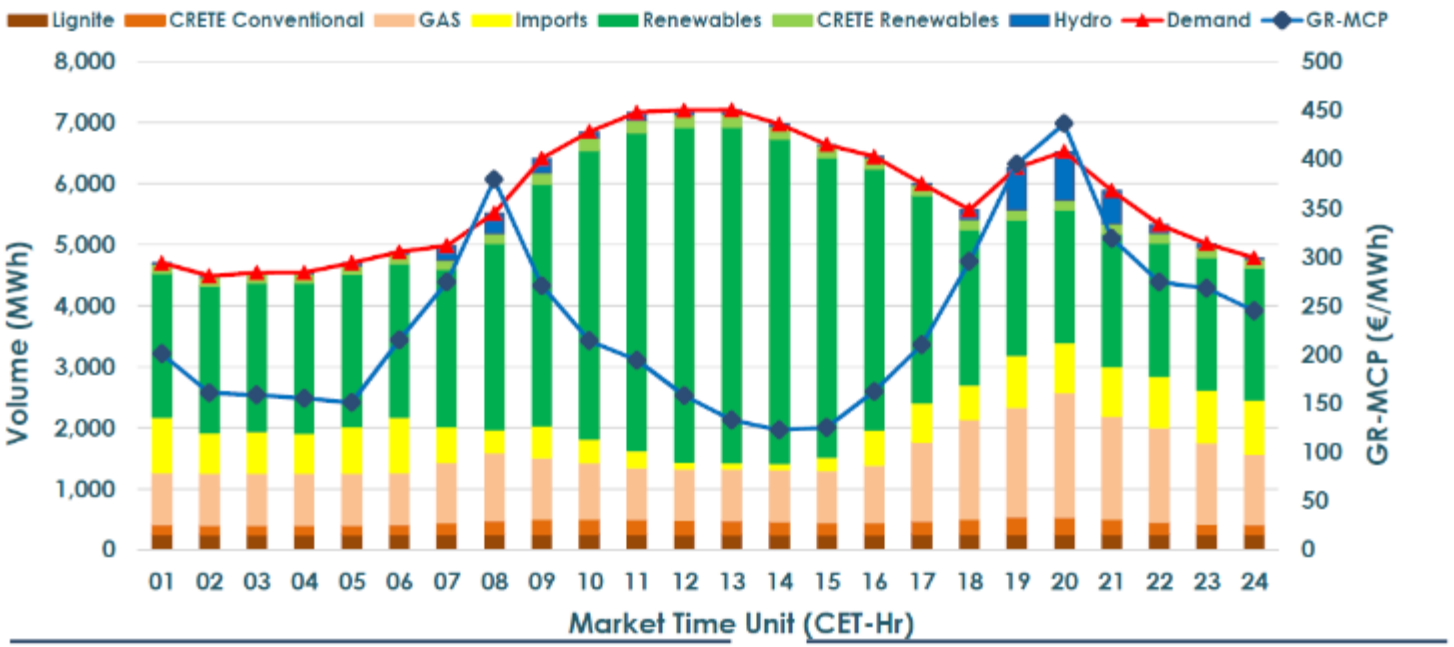


	2018	2021	
Total (TWh)	50,9	53,8	
RES (TWh)	16,2	22,3	
%	**31,7%**	**41,5%**	**+10%**
FOSSIL FUELS (TWh)	34,8	31,5	
%	**68,3%**	**58,5%**	**-10%**

Energy Mix Greece

HEnEx
Hellenic Energy Exchange S.A.

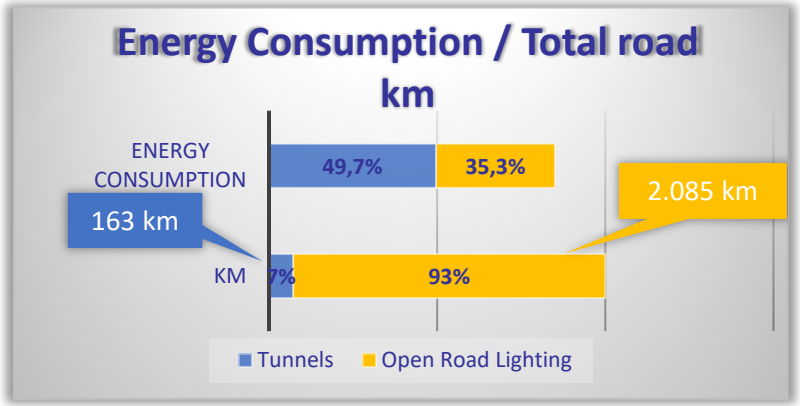
Day-Ahead Market Outlook

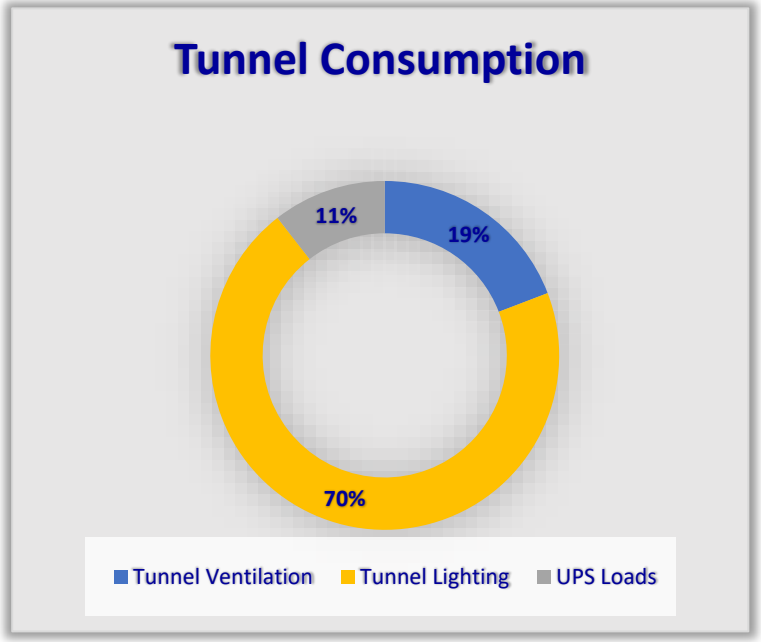


Intraday impact of RES to energy pricing

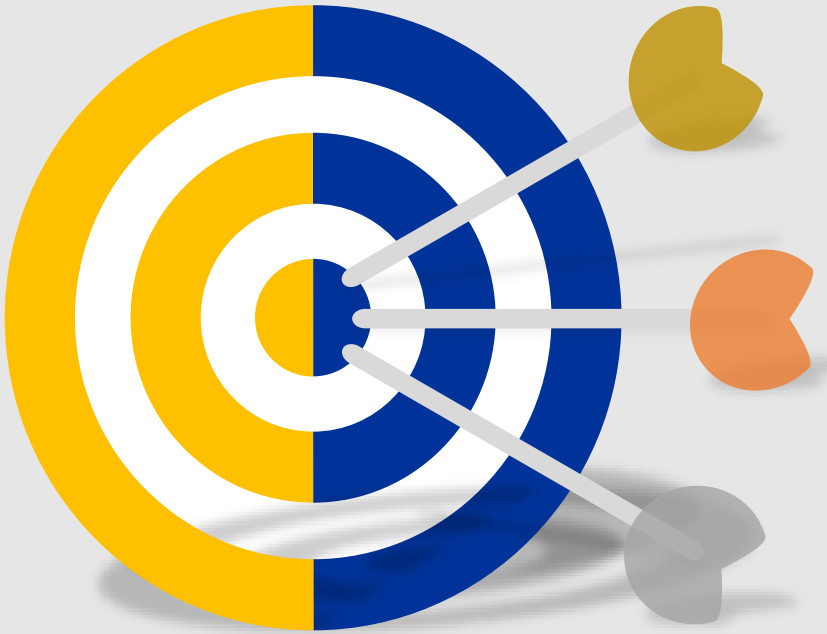
Ipto Analytics App

Energy Management Greek Motorways





Energy Consumption Goals 2022 - 2025



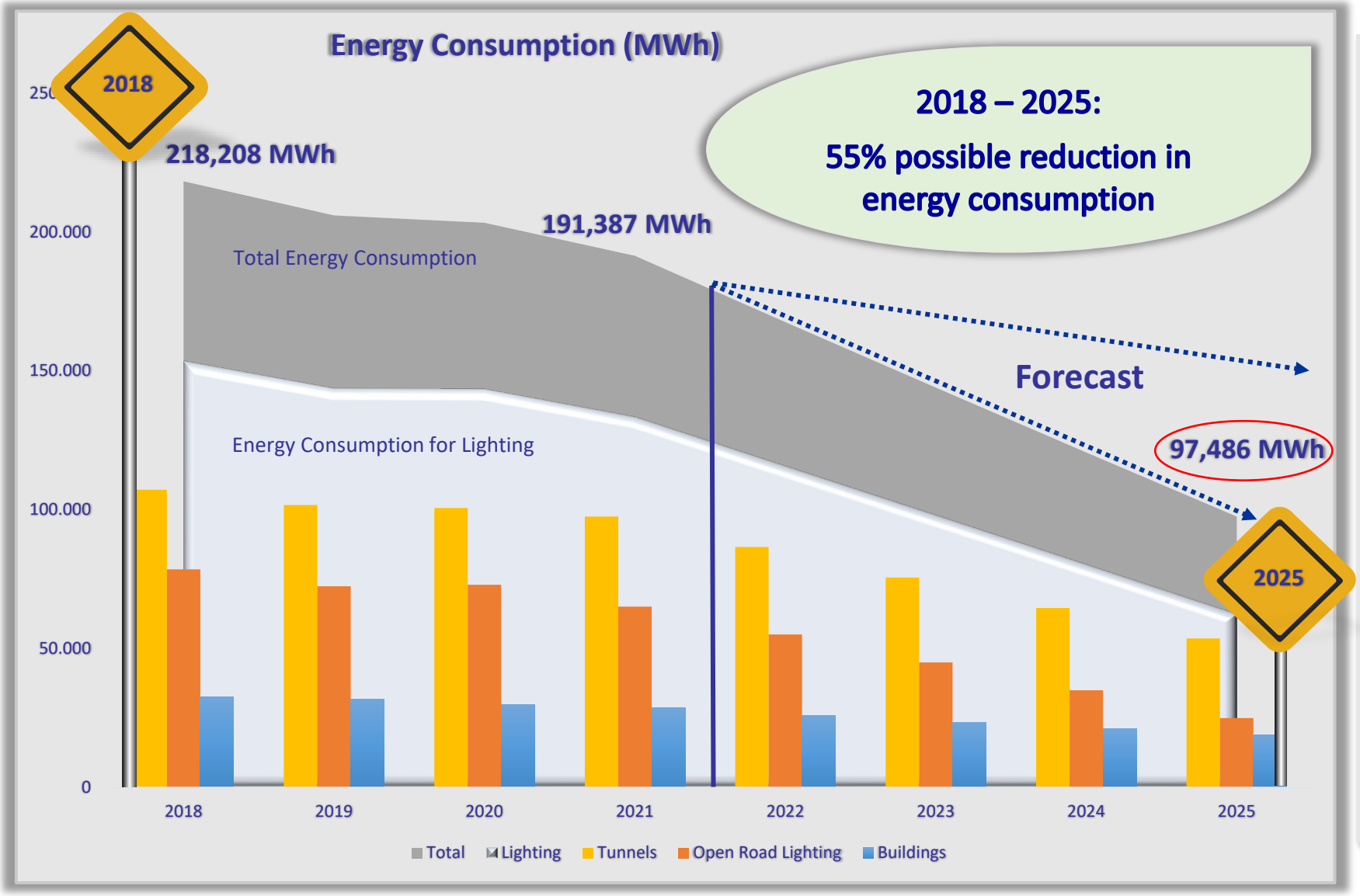
Open Road: – 68%
LED Installation
(according to EN13201)

Tunnels: – 50%
LED Installation

Buildings: – 42%
LED Installation
Energy efficiency

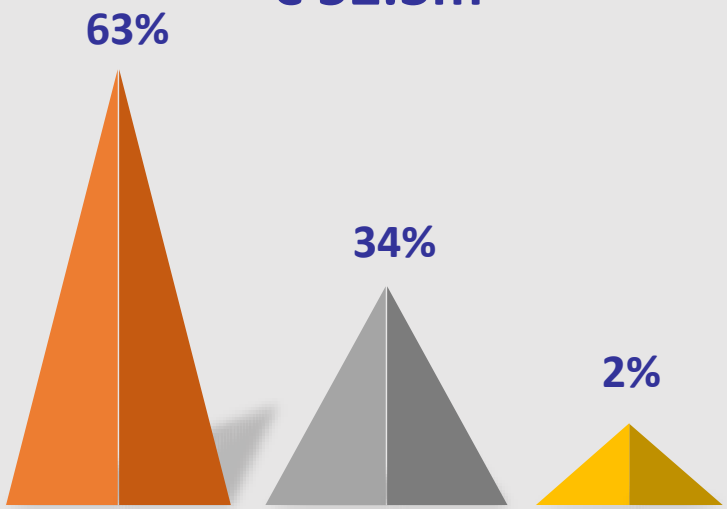
> 70% of energy is consumed for lighting

Energy Management Greek Motorways



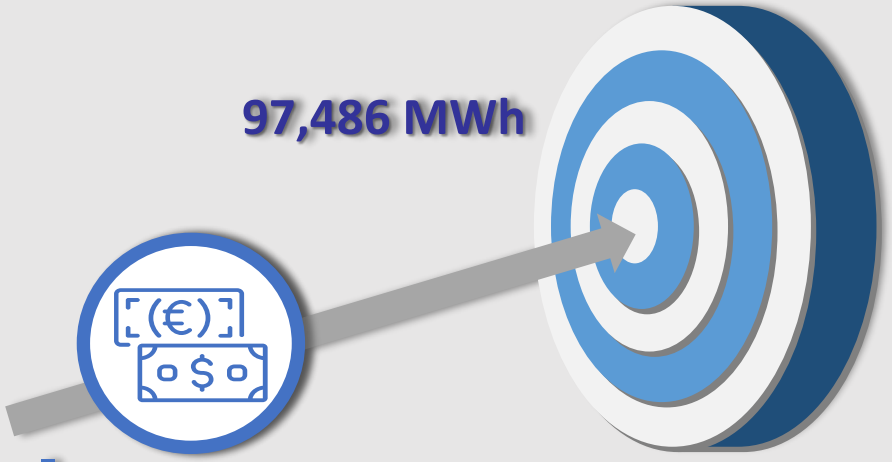
Estimated Investments 2022-2025:

€ 52.3m



Energy Management Greek Motorways

Energy Production Goals 2022 - 2030



Required Investments 2022-2025:
€ 94m

> 65 MW

Photovoltaic systems

Climate neutrality in terms of electrical power achievable by 2030

Energy Storage possibilities:

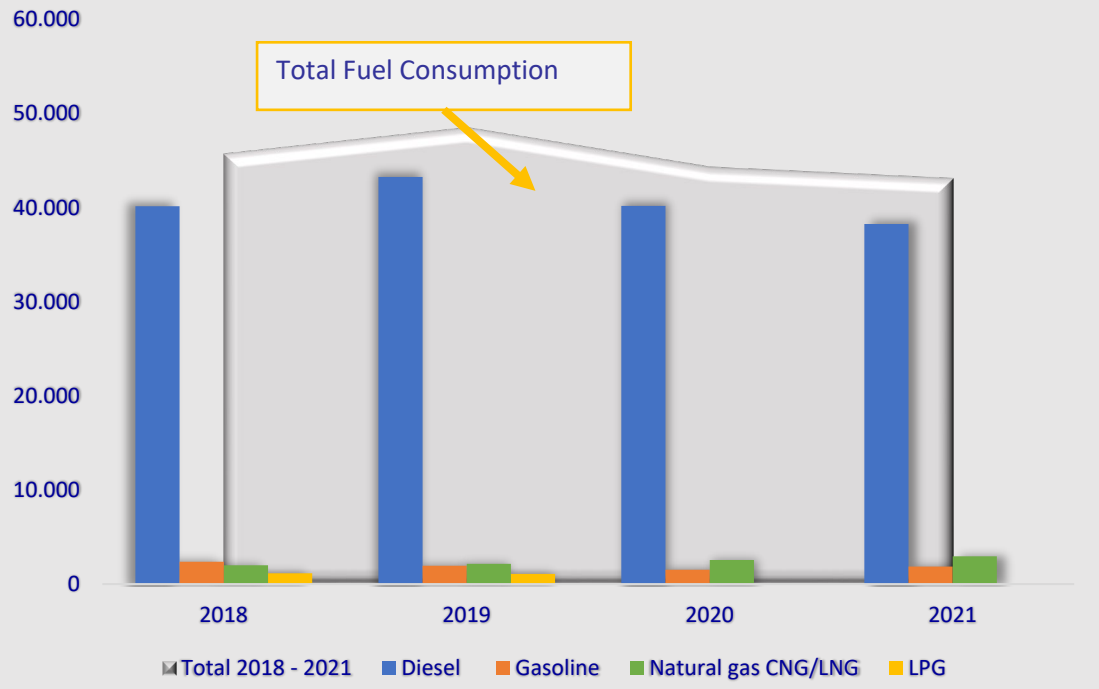
- Net Metering
- Batteries
- Hybrid energy Systems

Issues:

- Grid capacity (peaks)
- Bureaucracy and licensing process
- Delivery time and price increases of panels and inverters
- High cost of batteries and hybrid systems

Fleet Fuel Consumption Greek Motorways

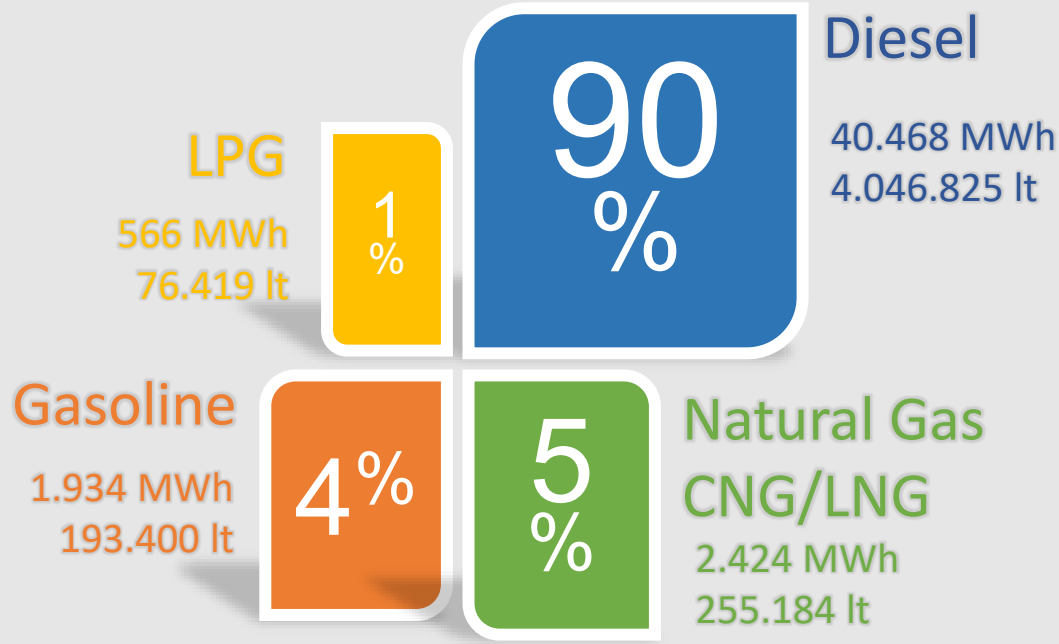
Fuel Consumption (MWh)



Average annual Fuel Consumption 2018 - 2021:
45,000 MWh
4,600,000 lt

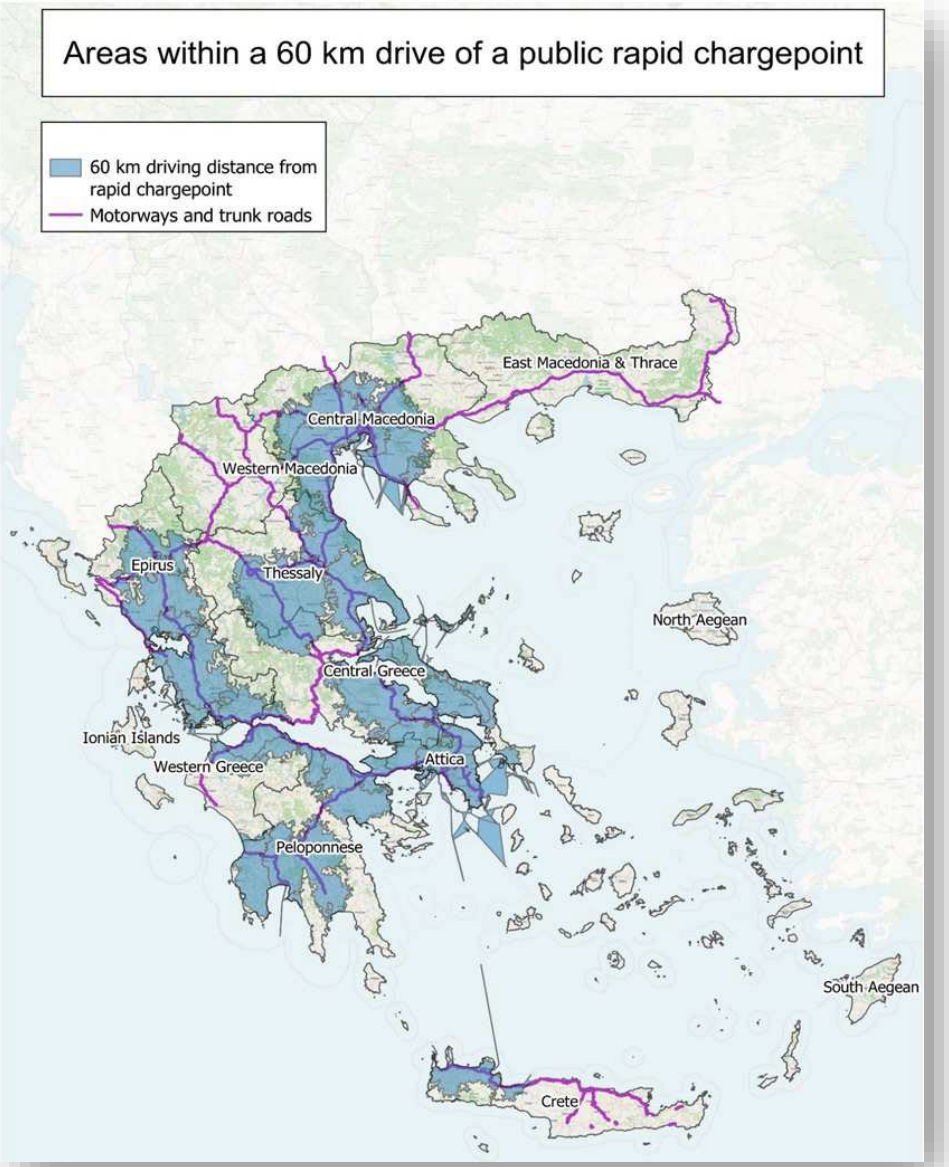
Total Average annual km : 40,000,000

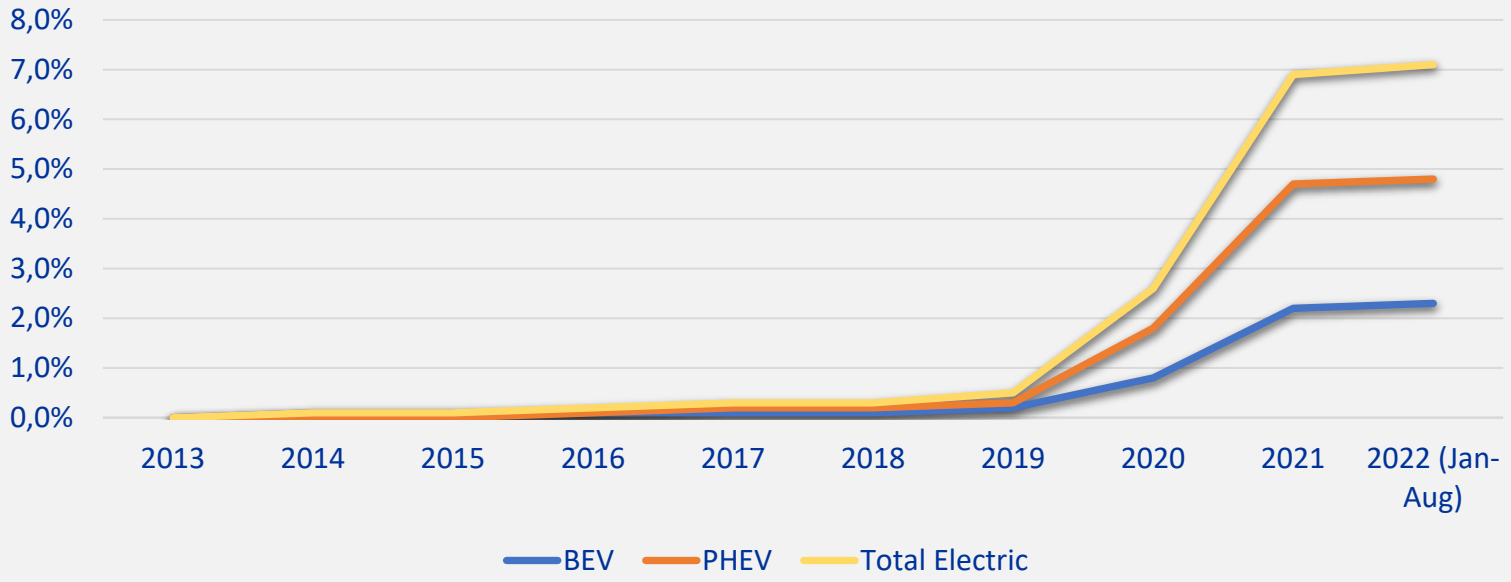
Average annual Fuel Consumption 2018 - 2021:



- **The Greek Motorways' Fleet annual fuel consumption equals to 45,000 MWh**
- **Electromobility of the Greek Motorway's fleet remains a challenge**

Electromobility in Greece



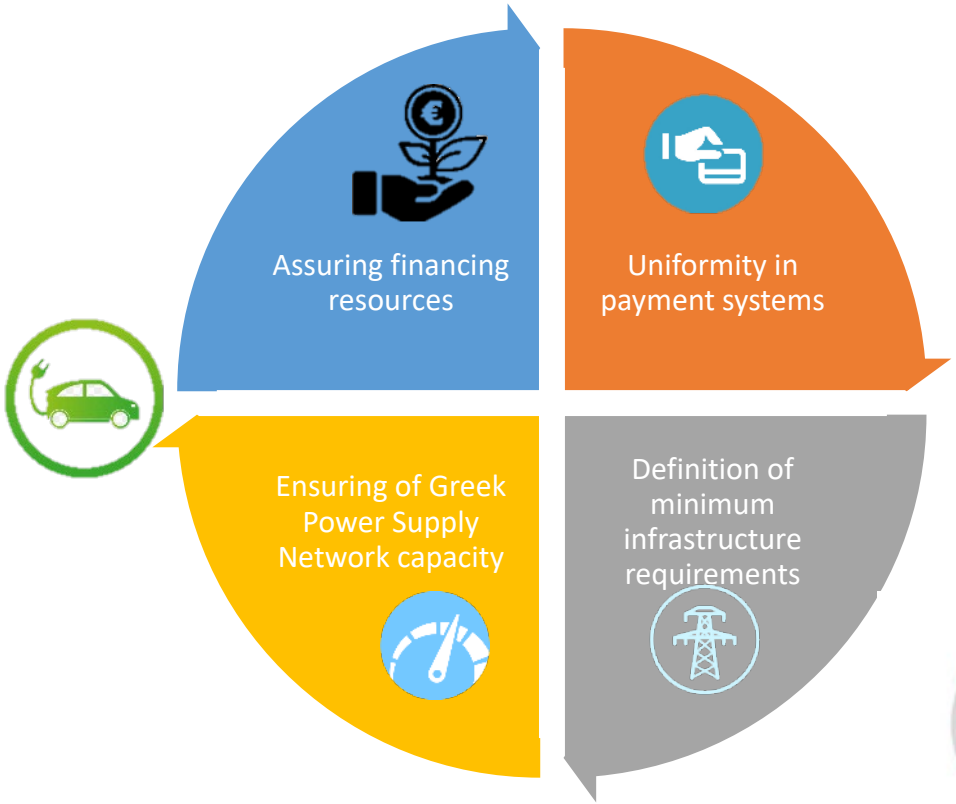


EV new registrations in 2022 only 7% (well below the 25% EU goal for 2024)

Electromobility in Greek Motorways

Major issues to be considered regarding electromobility in Greece

General issues



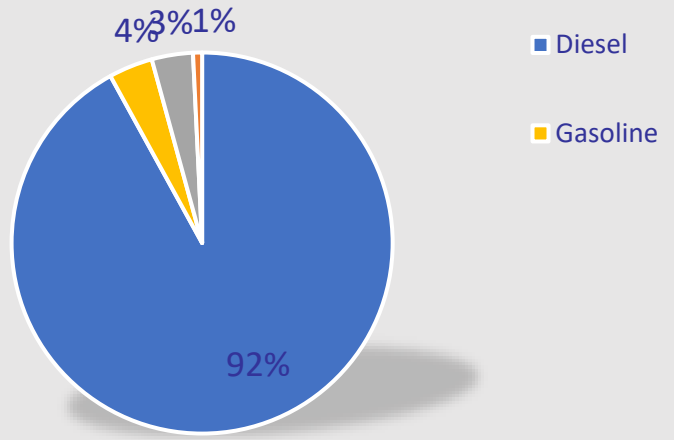
Greek Motorways' Fleet issues

- power autonomy (more than 400km distance covered in each shift)
- charging duration (24h patrols)
- power supply (patrolling cars carry electric consumption equipment)
- Power interruptions (need for H/Z)

The Greek Motorways' Fleet annual fuel consumption equals to 45,000 MWh, i.e. > 30 MW of installed PV systems and sufficient EV charging points along the motorway

CO2 Emissions Greek Motorways

Scope 1: Direct Emissions – Fuel Consumption

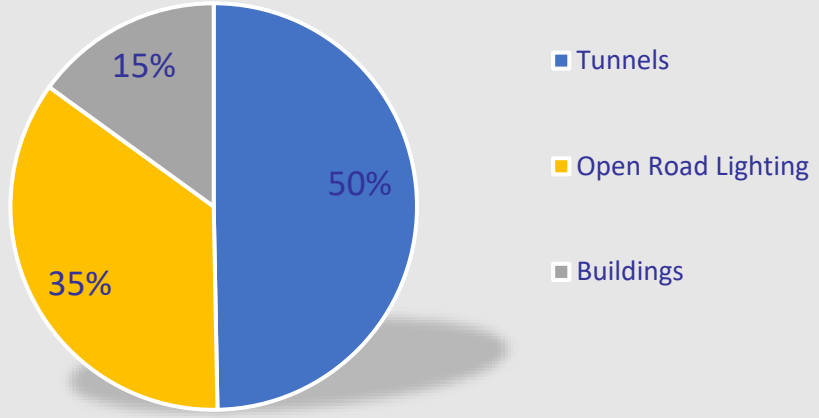


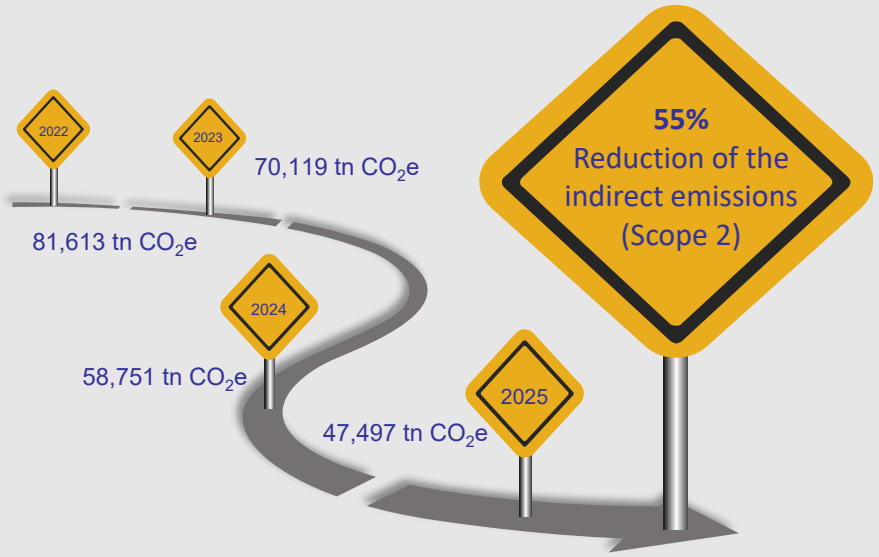
Average Annual Emissions
(2018 – 2021)
Scope 1
11,770 tn CO_2e

Average Annual Emissions
(2018 – 2021)
Scope 2
99,730 tn CO_2e

Total Average Emissions p.a.
(2018 – 2021)
113,519 tn CO_2e

Scope 2: Indirect Emissions - Electrical Consumption





- **Fleet of Greek Motorways accounts for 11% of total greenhouse emissions**

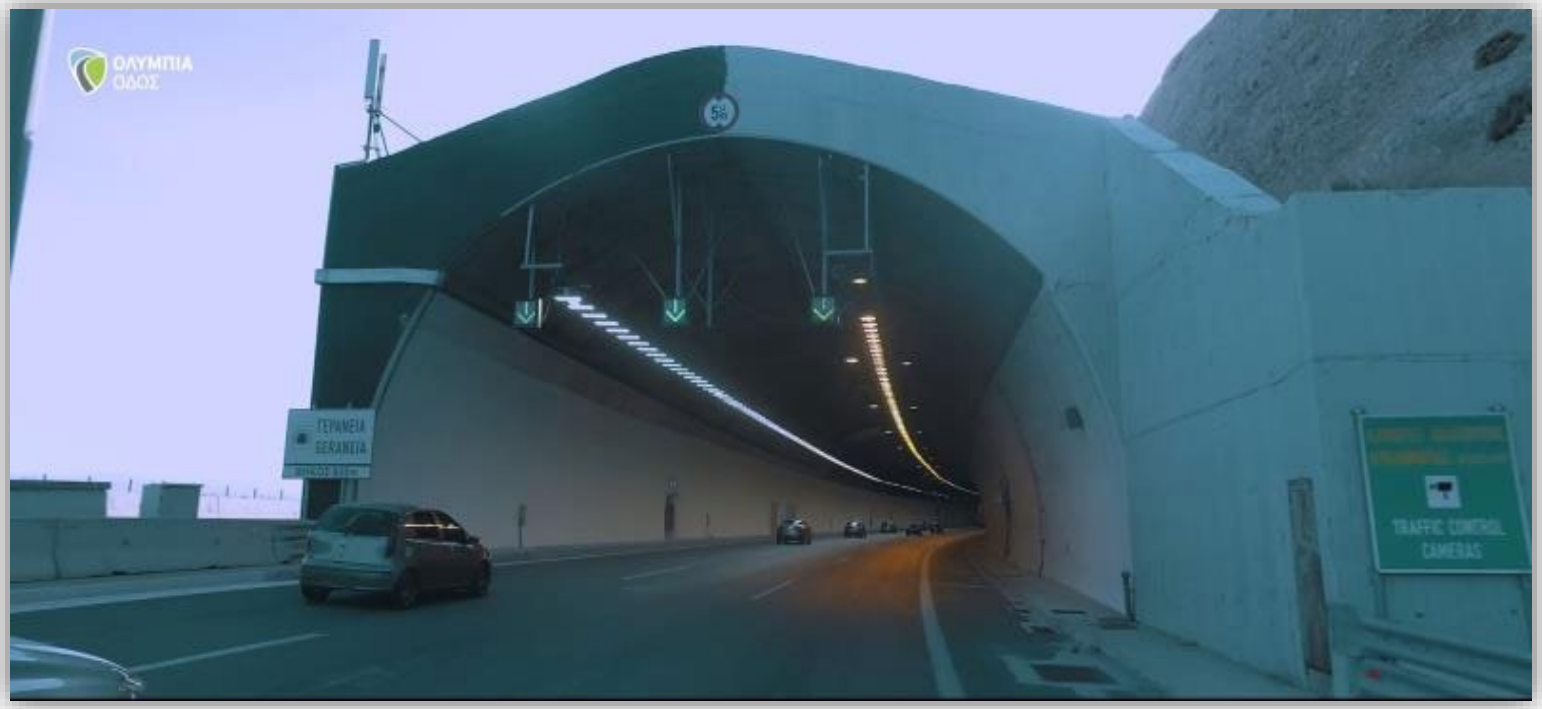
- **Carbon neutrality (net zero) of Greek motorways seems possible by 2030**
- **Green energy production and storage remain the main challenge**

Good Practice Example

- LED tunnel lighting – Olympia Odos

The Project was completed in 2019.

- ✓ Reduction in Installed Power: ~60%, 7,000 GWh
- ✓ Reduction in CO2 emissions: ~60%, 4,000 tn carbon dioxide equivalent
- ✓ Increased lighting performance/ Improved road safety
- ✓ Increased Occupational Safety
- ✓ Whitening asphalt surface for further energy savings



Three GOLD Awards

Good Practice Example Aegean Motorway

- LED Open Road

The Project was completed in 2019.

- ✓ 8,794 luminaries were changed across a length of 199.4 km
- ✓ Reduction in Installed Power: ~ 56,4%, 7,420 GWh
- ✓ Increased lighting performance/ Improved road safety
- ✓ Increased lifetime of luminaries to 12 years compared to conventional luminaries
- ✓ Reduction in light bulbs maintenance cost by 70%
- ✓ Increased Occupational Safety

Three GOLD Awards plus the one BEST of the BEST

Good Practice Example Nea Odos

- Hybrid Electric Vehicle Charging Station Initiative – Malakasa MSS (Sirios)

The first & biggest electric vehicle charging stations that offer fast charging directly from solar panels installed on canopies at the respective parking areas, thus combining the production of green energy and electric car charging

4 double chargers at each direction *(2 CCS/CCS & 2 CCS/ CHAdeMO)*

- Each charger is able to charge two cars simultaneously.
- While the maximum power reaches 120 kW.
- In case two vehicles are charged at the same time, the power is shared according to each car's demands.

The project has recently been completed

Conclusions and Outlook

- Electricity consumption of motorways concern in its very large majority (70%) road lighting.
- Between 2018 and 2021, initiatives of several motorways reduced electricity consumption of open road and tunnel lighting, achieving a reduction of 12% of the total energy consumption of Greek Motorways.
- Once all energy saving projects are completed on the Greek motorway network, a reduction of 55% compared to 2018 to 97 GWh is expected.
- The replacement of the presently operating fleet with EV will generate additional electricity needs of some 45 GWh p.a.
- In order to get to net zero, renewable energy of more than 95 MWp of installed PV systems would be required.
- The investments required for above scope 1 and 2 initiatives would exceed € 200m (excl. EV and energy storage)

Hellastron Motorways aim to reduce electrical consumption by 55% until 2025.

Carbon neutrality (net zero) by 2030 is possible but challenging!

ASECAP DAYS

BRUSSELS 2022

THANK YOU FOR YOUR ATTENTION

Dimitrios Gatsonis, CEO
Aegean Motorway S.A.
Hellastron/ Head of Sustainability Taskforce
41500 Moschochori, Larissa, Greece
Tel: +30 2410 680300
Email: dgatsonis@aegeanmotorway.gr