



**ΚΑΠΕ
CRES**

CENTRE FOR RENEWABLE
ENERGY SOURCES AND SAVING



Energy efficiency in Transport

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CRES presentation

The Centre for Renewable Energy Sources and Saving (CRES) is the Greek National Centre for Renewable Energy Sources (RES), Rational Use of Energy (RUE) and Energy Saving (ES)

CRES was founded in September 1987, it is supervised by the Greek Ministry for the Environment and Energy and has financial and administrative independence.

Its main goal is the promotion of RES/RUE/ES applications at a national and international level, as well as the support of related activities taking into consideration the environmental impacts, in the energy supply and use.



Identity of CRES: Two directions

National Energy Centre

In support of :

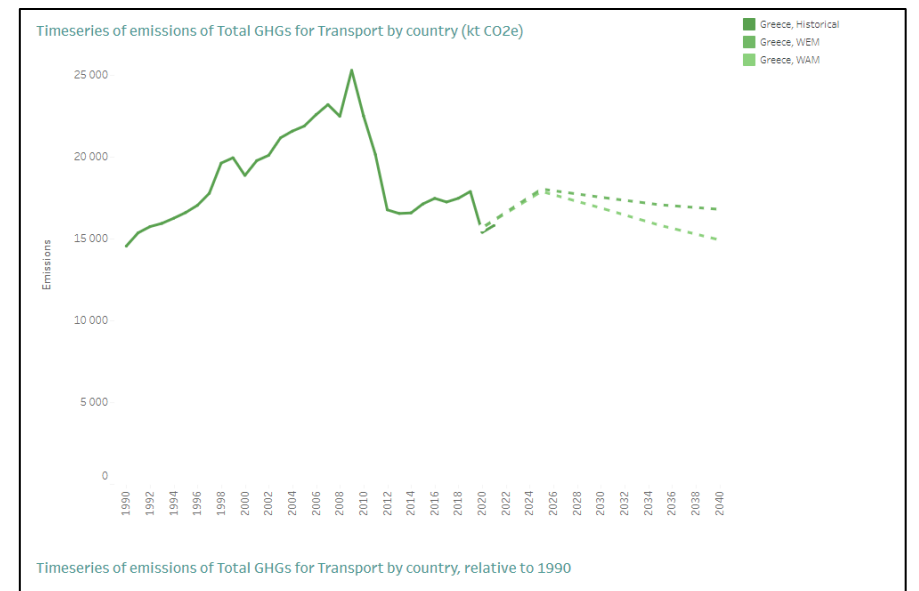
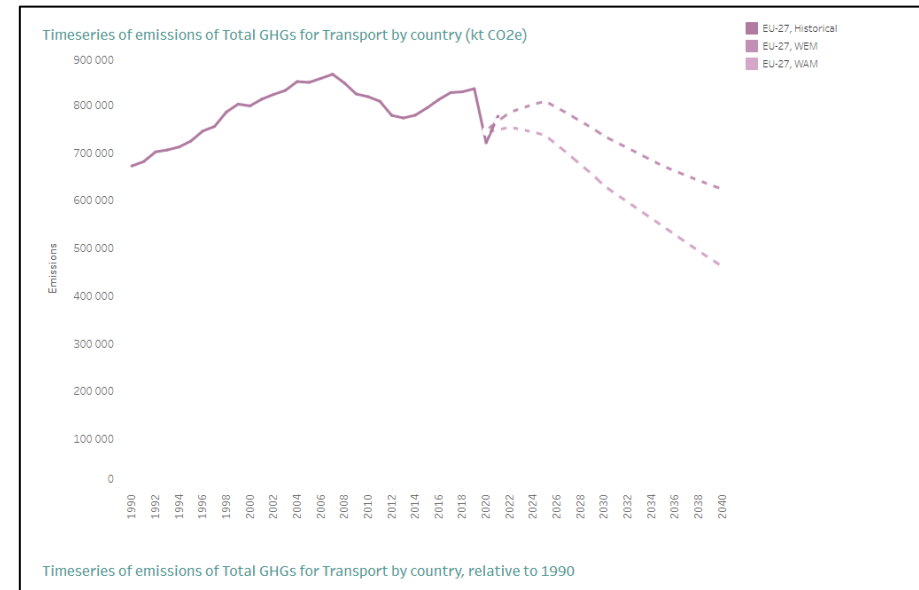
**Policies Formulation
Investment Programmes Management
Energy Planning
Dissemination**

Energy Research Centre

**Renewable Energy Technologies
Energy Efficiency Technologies**

EU Transport emissions

- **Paris Agreement** -> max increase of global temperature 1.5 – 2.0 °C (but we are already at +1.0 °C !)
- **Transport GHG emissions** increased by more than **33%** between 1990 and 2019
- With the **existing policy measures**, transport (CO₂) emissions are projected to be **3.5% higher** in 2030 than in 1990 and to fall by only **22%** by 2050 compared to 1990 levels (comparing to the necessary **90% decrease!**)
- **Road transport** accounts for **72%** of EU transport emissions
- **Transport emissions share 29% in Greece** – also share of renewables in transport only **5.3% (2020)** compared to the **10% target**

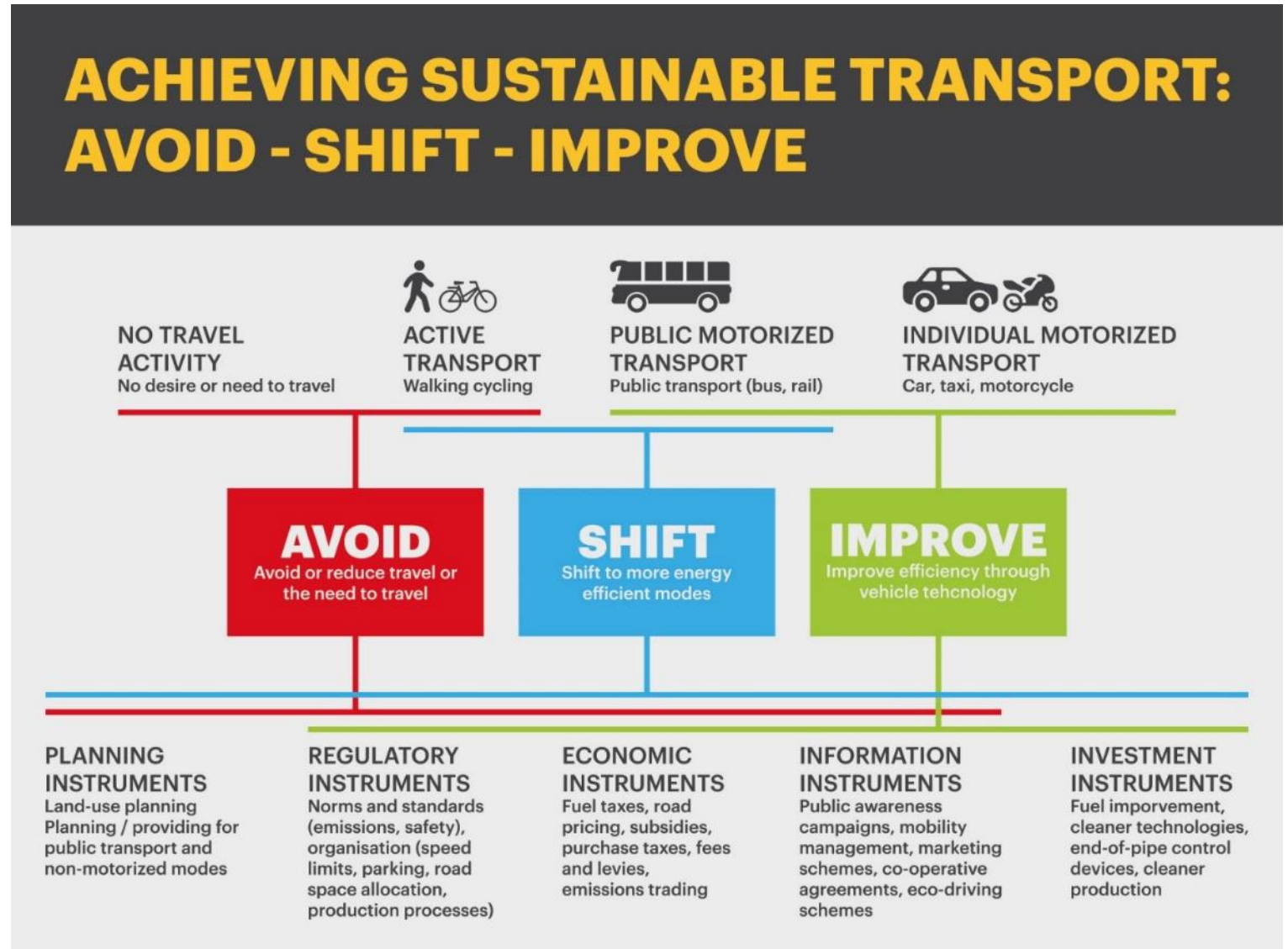


Transport



To reach our targets, the whole **Avoid-Shift-Improve** framework needs to be addressed!

Avoid and Shift strategies can account for a significant part of transport emission reductions, at lower costs than **Improve strategies**



Sources: SUTP.org
Towards Zero Foundation



EU Transport emissions

EEA: 'the fundamental issue is not how to create a more sustainable car, but rather how to meet society's need for point-to-point mobility and, perhaps more fundamentally, for social interaction and access to goods and services. Transition for sustainable mobility will require innovations and changes in social norms, values and lifestyles

The way in which the transport system is organised might change drastically in the future, for instance via the increased availability of shared transport services or, even more fundamentally, when vehicle automation of a high degree becomes a reality



The Metrohess project

Development of a **Hybrid Energy Storage System** that uses the energy from the **regenerative braking** in Athens Metro rail systems to cover auxiliary loads of electromechanical systems such as Lighting Systems, Escalators, Elevators and other base loads.

Until now, **this amount of energy stays unused** and is released as heat to the environment.

The project was funded by (ERDF) and by the National Resources through OP: Competitiveness, Entrepreneurship & Innovation (EPANEK). Other partners: Attiko Metro, University of Hannover, Stercom

The architecture of this Hybrid Energy Storage System is based on the **combination of components with different electrical characteristics as batteries and super-capacitors** and their operation is managed by **power electronics**.





The Metrohess project

- Stations power consumption accounts for 38% of the total power consumption of the Athens Metro
- The conceptual design of dual-technology MetroHESs foresees a base storage (batteries) and a peak storage (supercapacitors). The **scalable storage system** may serve - apart of Athens Metro - **any metro system**
- With the application of the hybrid storage system, the energy produced by the **regenerative braking** of trains could be used to **meet 90% of the needs of the stations**





EMOBICITY - Project and Consortium

EMOBICITY - Increase of energy efficiency by Electric MOBility in the CITY

Objective of the EMOBICITY project is the **promotion of e-mobility** at a national and regional level

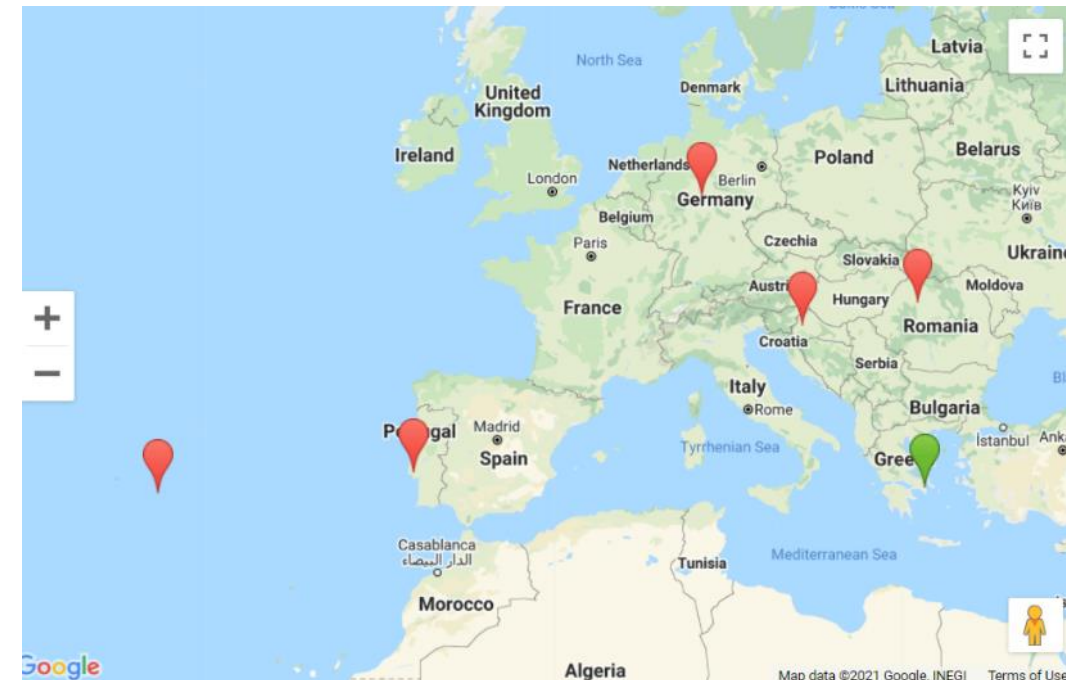
Interreg Europe Program

Lead Partner: CRES

Project budget: 1,071,804 €

- Centre for Renewable Energy Sources and Saving (CRES) – LP**
- Energy Institute Hrvoje Pozar (EIHP)**
- Regional Management Northern Hesse GmbH (RMNH)**
- Azorean Government – Regional Directorate for Energy (AZORES)**
- Portuguese Energy Agency (ADENE)**
- Northwest Regional Development Agency (NWRDA)**

Duration: 01/08/2019 – 31/07/2023



■ Lead Partner ■ Partner

EMOBICITY – Capacity building



Local Stakeholder Group meetings



Thematic Workshops

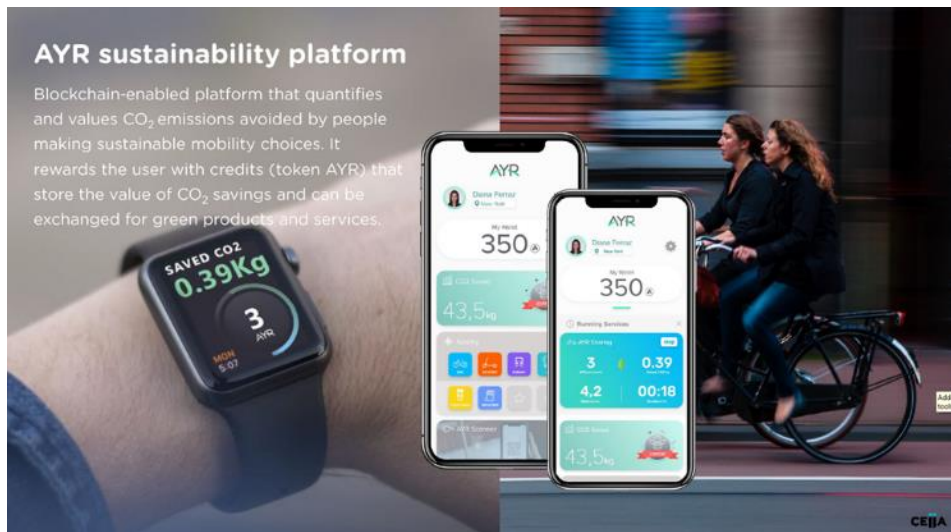
Study Visits

E-mobility reports



AYR sustainability platform

Blockchain-enabled platform that quantifies and values CO₂ emissions avoided by people making sustainable mobility choices. It rewards the user with credits (token AYR) that store the value of CO₂ savings and can be exchanged for green products and services.



Publishable Report

- Inner city logistics and autonomous driving -

Author:
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Contribution:
Centre for Renewable Energy Sources and Saving (CRES) – lead partner
Energy Institute Hrvoje Pozar (EIHP)
Portuguese Energy Agency (ADENE)
Azorean Government – Regional Directorate for Energy (AZORES)
Northwest Regional Development Agency (NWRDA)

ELISA e-Highway



Source: <https://ehighway.eu.hessen.de/node/20>



EMOBICITY achievements

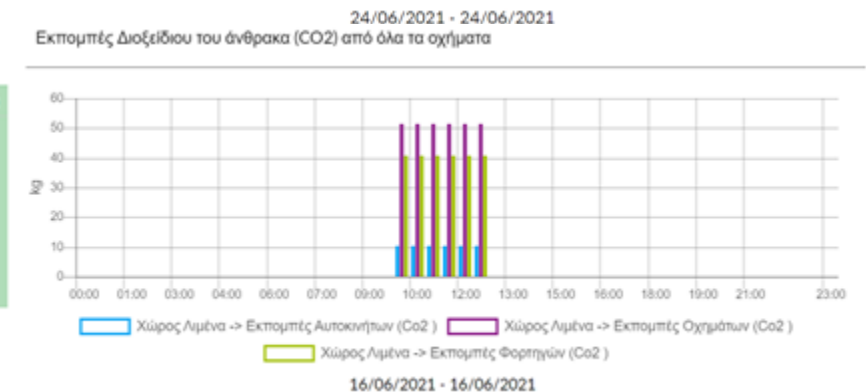
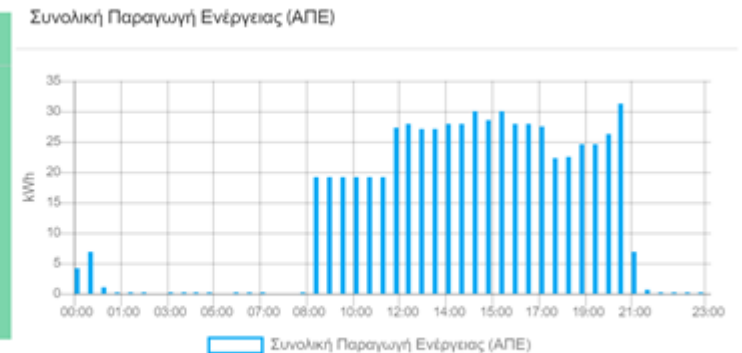
Impact on Policy Instruments so far:

- Knowledge gained from EMOBICITY served as input during the design of the **Go Electric subsidy scheme** in Greece
- Knowledge exchange within EMOBICITY (AYR platform from Portugal) served as inspiration for the design of the monitoring platform of the Micromobility program in Greece

The **identified good practices** are already proven in practice, therefore suitable for **direct adaptation to local specifications** and implementation!

The PERFECT project

- PERFECT: Port Energy eFFECTive
- Development of a **smart platform** for monitoring energy production/consumption in **ports**
- Port **energy audit** to identify current energy consumption / emissions baseline
- **Interaction with other operational systems** of the port – Berth management, BEMS, sensors to identify traffic at the control gates etc
- **Alerts to the operator** to reduce energy consumption / emissions

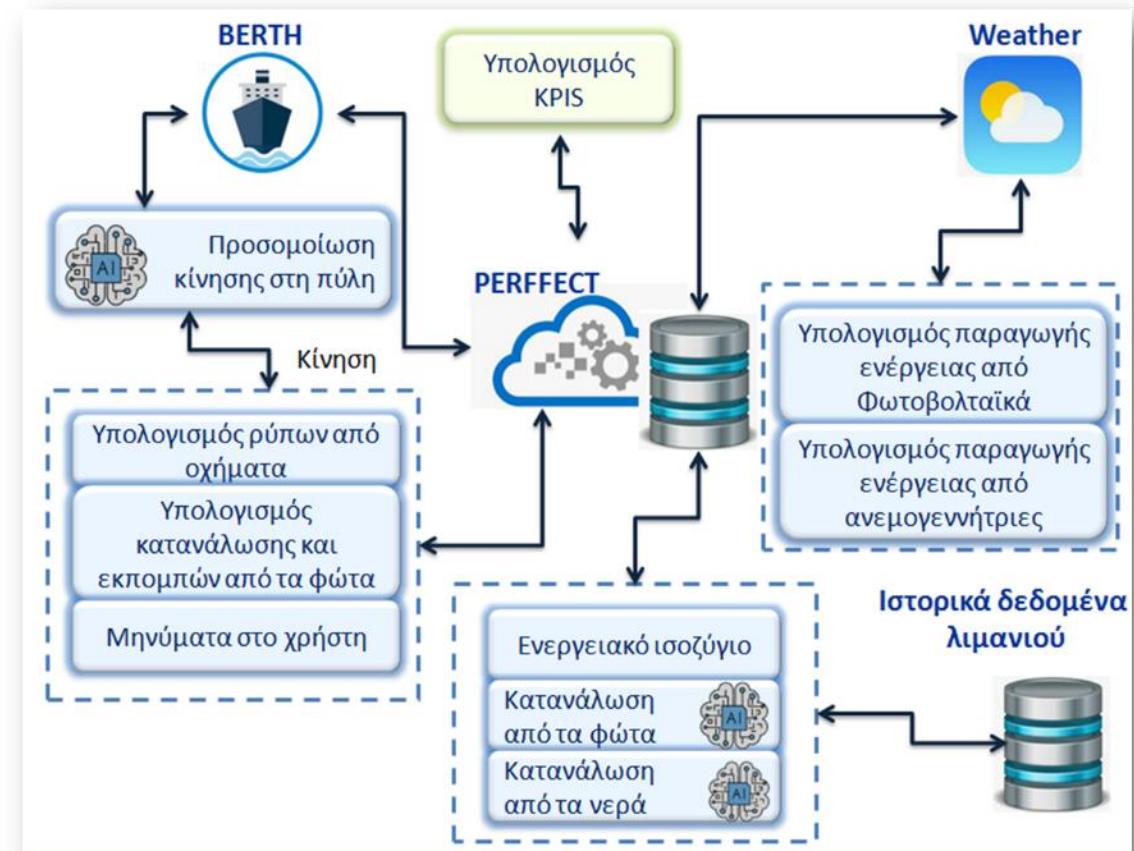




The PERFECT project

Some indicative use cases:

- Energy saving - **lighting in the ISPS sector** of the port – use of the berth management system to turn off/dim lighting when not necessary
- **Energy saving for the incoming trucks** – the system sends message to the operator to open an extra control gate to reduce traffic and emissions
- The operator knows at any time what is the **percentage of green energy produced in the port from RES**





Micro-mobility Programme for Municipalities

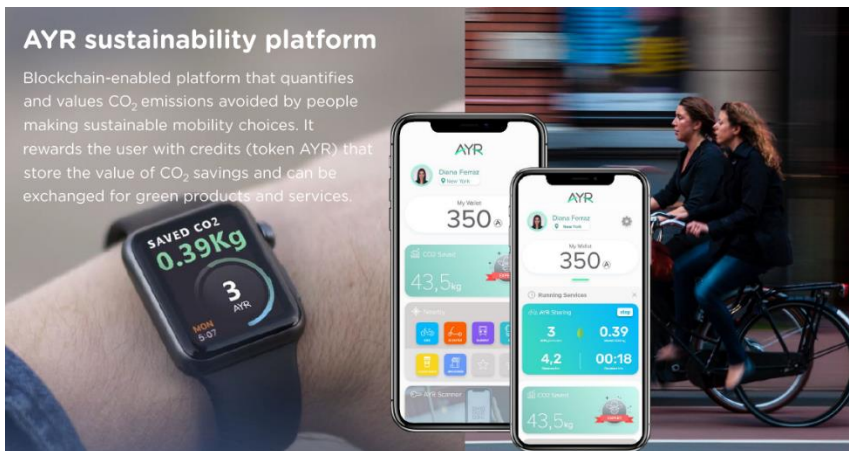
- Sustainable urban micromobility through the development of municipal **e-bike sharing** schemes
- Funded by the National Operational Programme “Transport Infrastructure, Environment and Sustainable Development“
- Addressed to Greek Municipalities and / or their Development Companies
- Expiration date of expenditure eligibility: **31/12/2023**
- Budget: **53 mil. €**
- Eligible costs include (indicatively): sharing e-bikes, infrastructure (charging stations, software etc)



Micro-mobility Programme for Municipalities

Dedicated platform for measuring and monitoring the operation of micro-mobility schemes

An application will also be developed, as a **tool for informing and rewarding citizens** who adopt sustainable modes of transportation, such as the shared e-bike.



The application will **quantify the CO₂ emissions avoided** through the use of shared electric bicycles compared to the use of conventional vehicles and will convert them to **eco-tokens**, saved in the **digital wallets** of the users.

Inspiration from EMOBICITY Project (AYR sustainability platform in Portugal).



Thank you!

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<http://www.cres.gr>