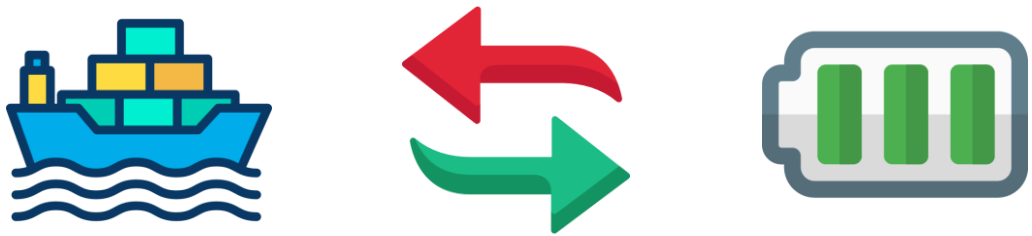
Battery Swapping in Waterborne Transport

Yannis Kalenteridis, Aimilios Mouchtaropoulos, Dimitris Kontosfyris

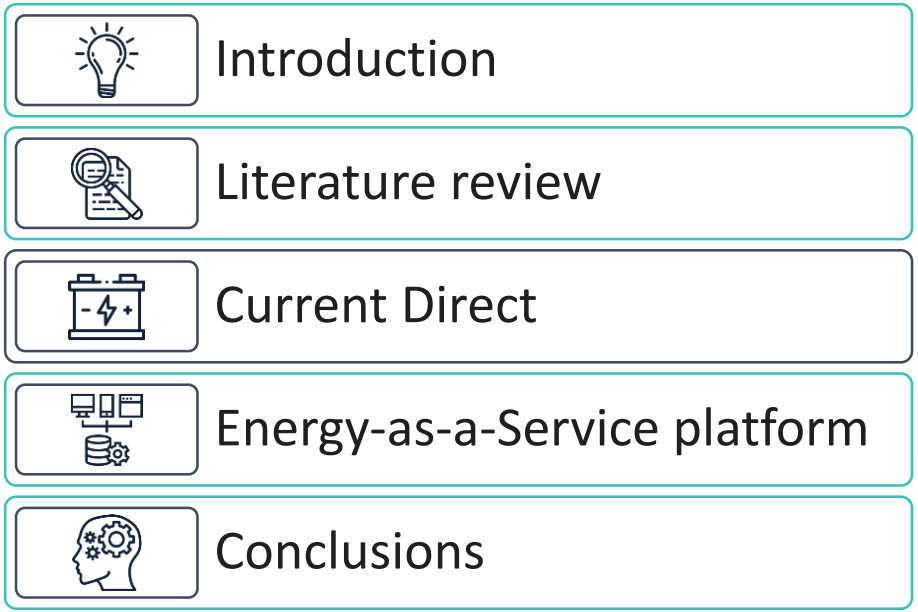
Presented by: Dimitris Kontosfyris



8th International Conference on Environmental Management, Engineering, Planning and Economics

Saturday 24, July 2021 • Thessaloniki, Greece

Outline


Introduction
Literature review
Current Direct
Energy-as-a-Service platform
Conclusions

Introduction

The problem:

One of the largest GHG emitting sectors.

The answer:

Irreversible shift to low GHG emission mobility.

The hope:

Marine propulsion using battery power.

Introduction

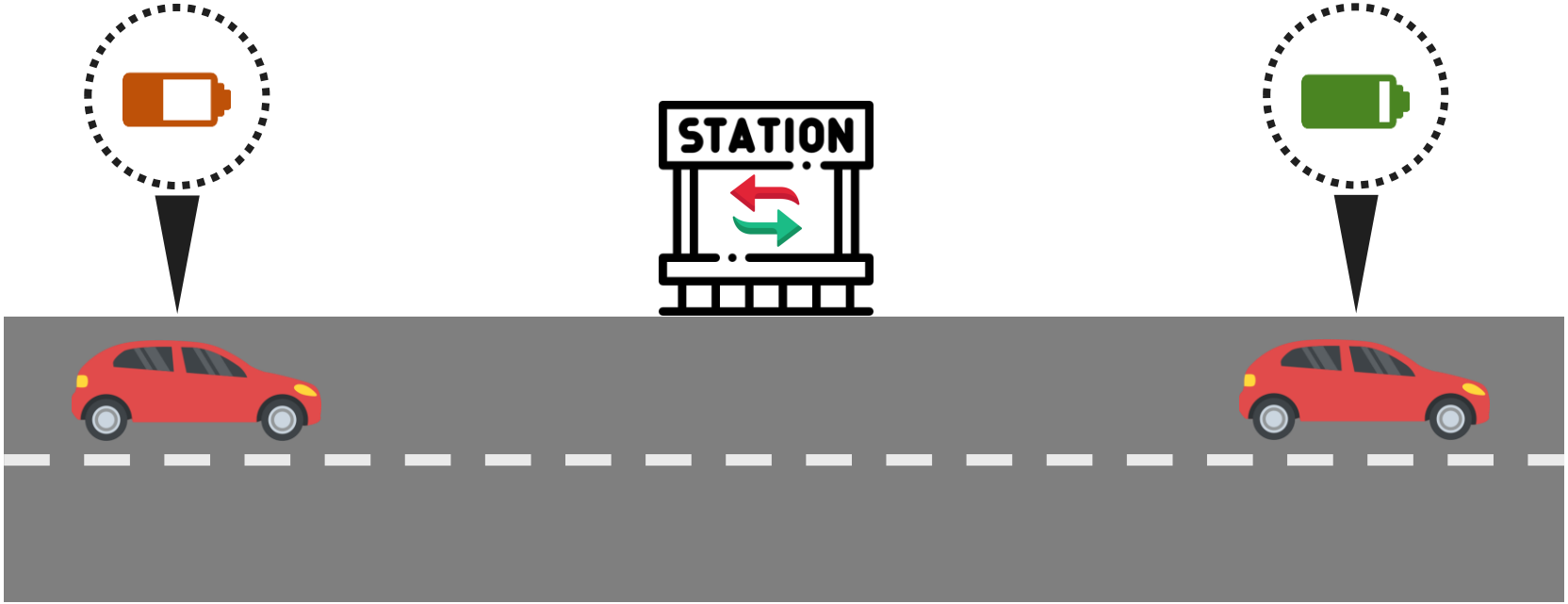
1. Containerized lithium-ion cell battery.
2. Swappable battery system approach.
3. Optimized for waterborne transport.
4. Innovative business model.

Introduction

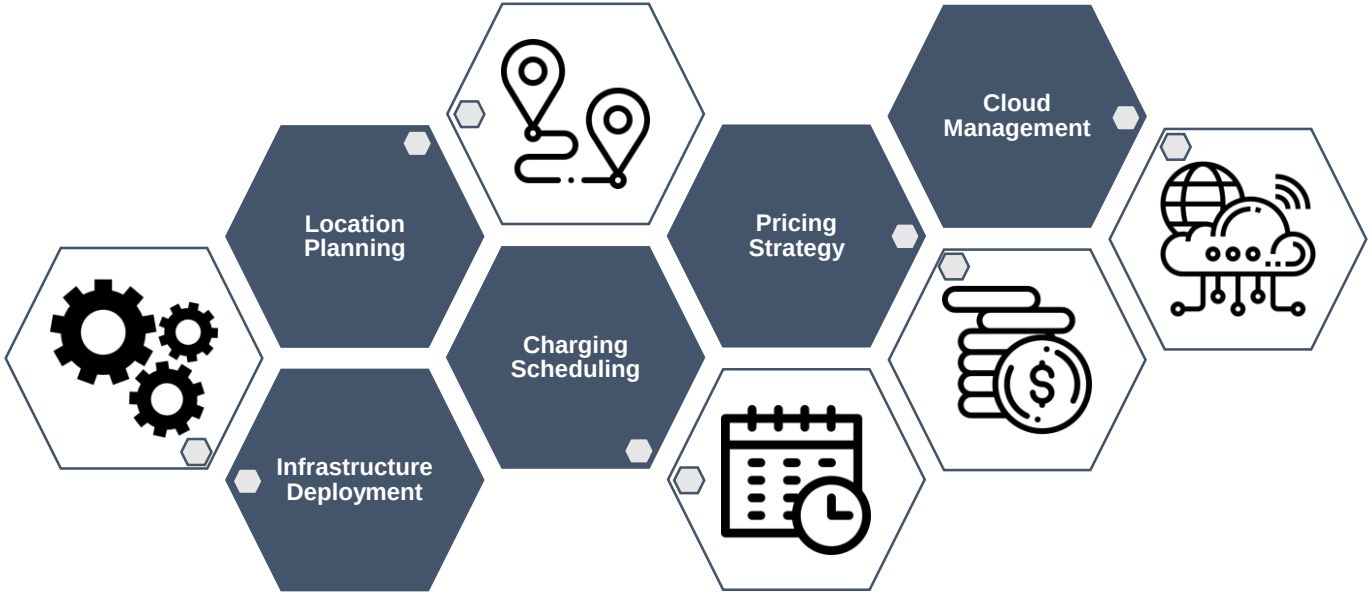
Energy-as-a-Service

Pay-Per-Use

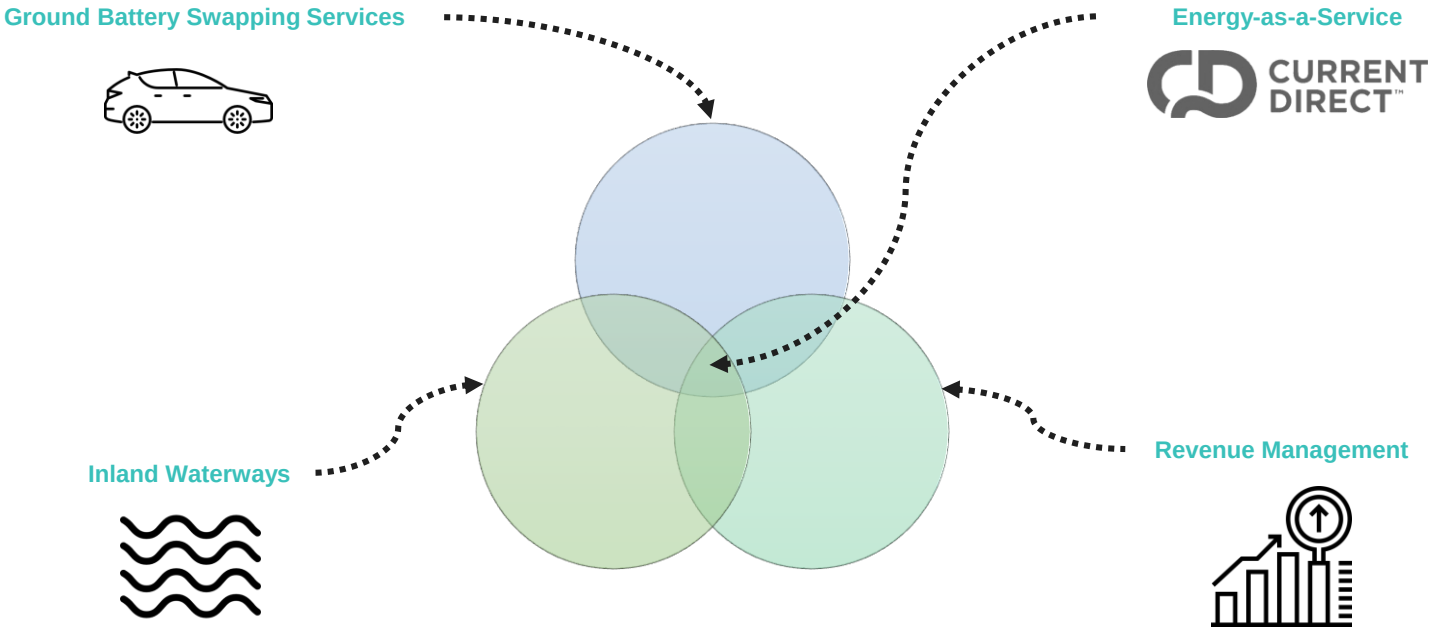
Literature review



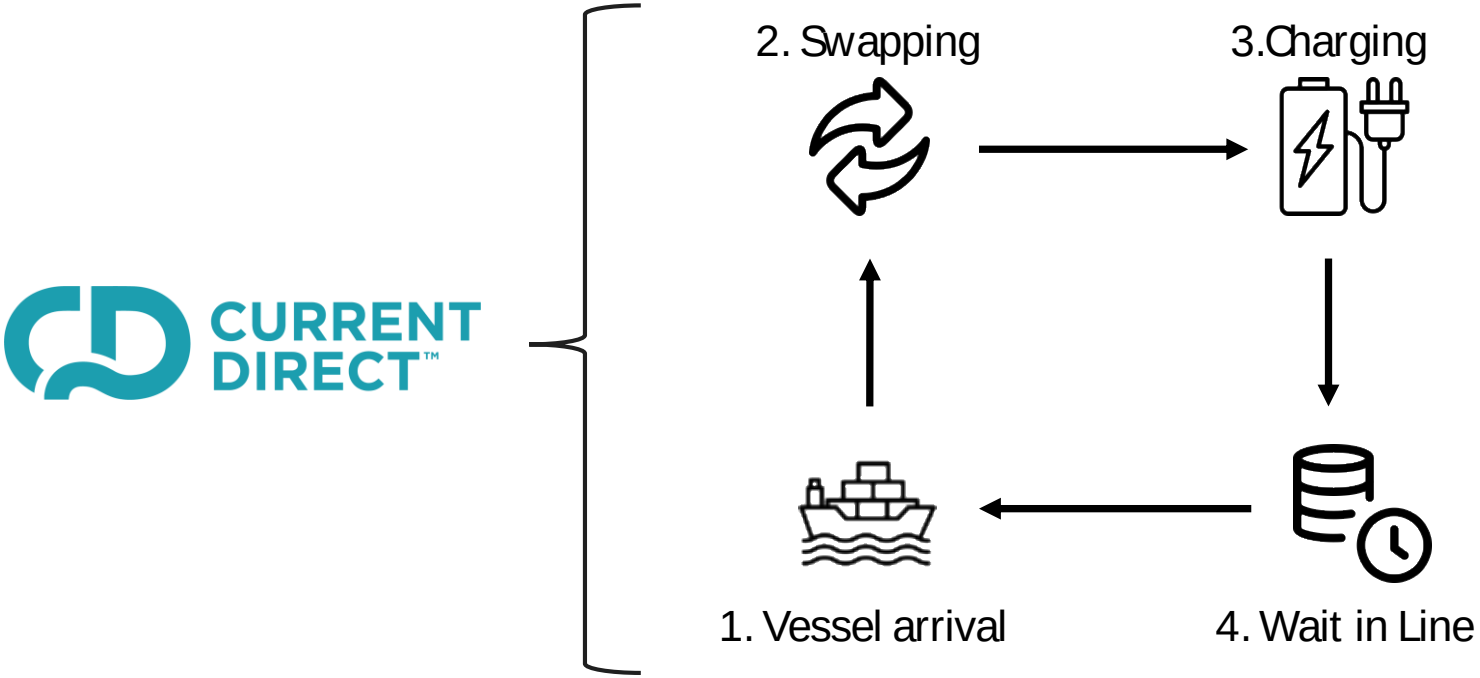
Literature review



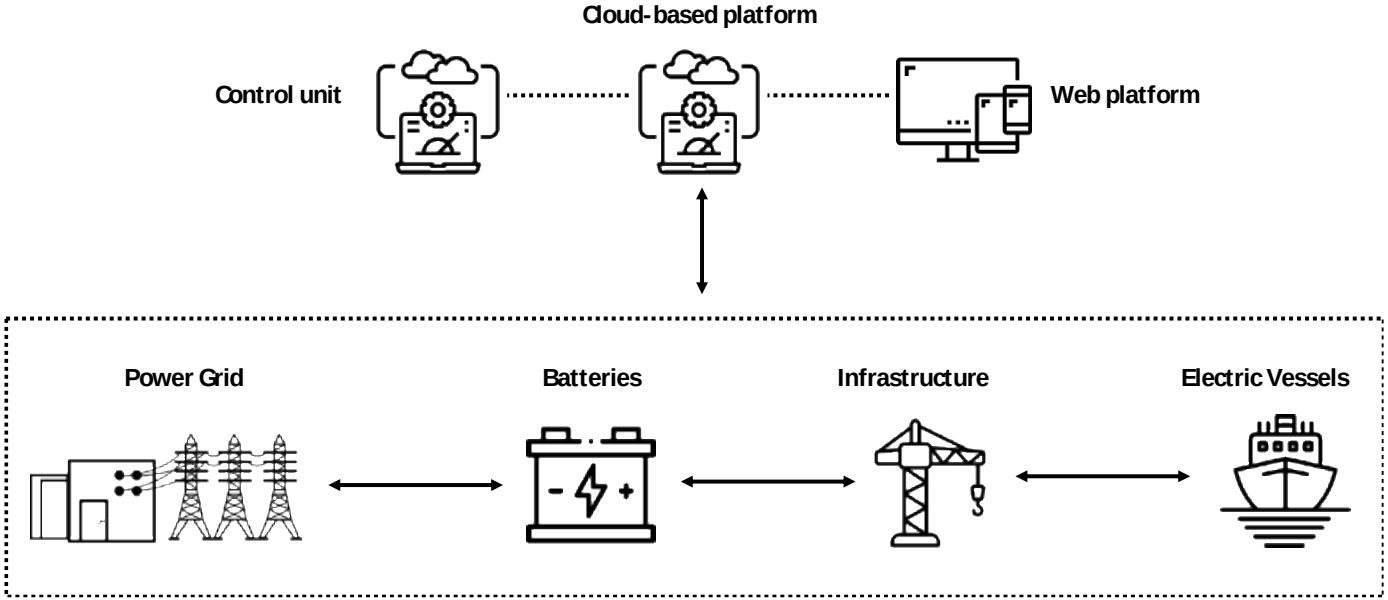
Literature review



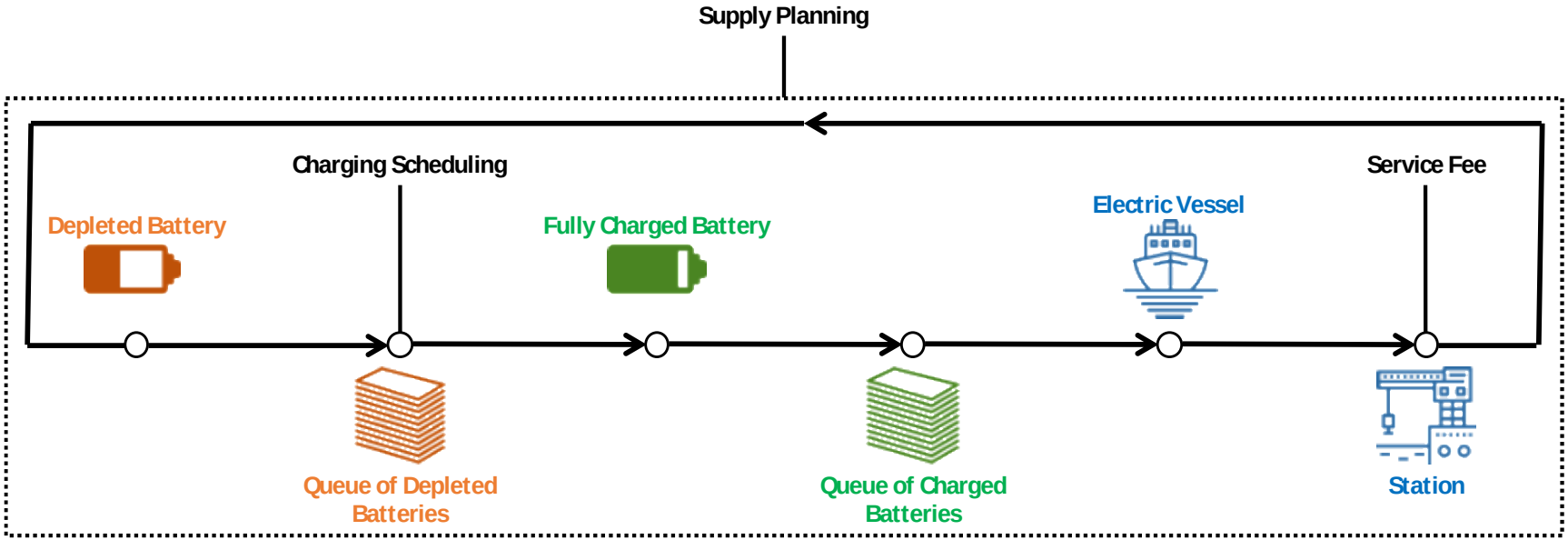
Current Direct



Current Direct



Current Direct



Energy-as-a-Service Platform

Charging Scheduling

Service Fee Calculation

Supply Planning

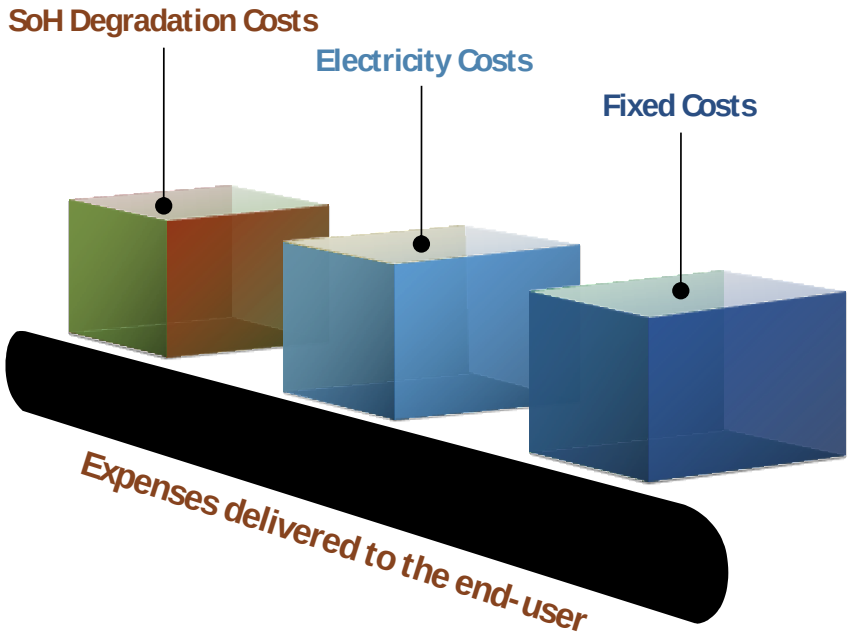
Revenue Optimization

Cost Mitigation

Energy-as-a-Service Platform

✓ Adjust the charging behaviour from traditional disorderly to orderly.
Avoid stretching the overall power capacity limits, while taking advantage of the utility company's pricing scheme.

Energy-as-a-Service Platform



Conclusions

- ✓ Significantly reduce the total lifetime cost of waterborne transport batteries by 50% through novel materials, manufacturing processes and optimized components.
- ✓ Cut GHG emissions of the marine transport sector through electrification of existing and future vessel fleets.
- ✓ Increase the installed energy of containerized energy storage systems by 300% compared to currently available systems.
- ✓ Trigger investments for innovation, employment, and knowledge creation in the European marine transport and battery energy storage sectors.

Battery Swapping in Waterborne Transport

Thank you for your attention