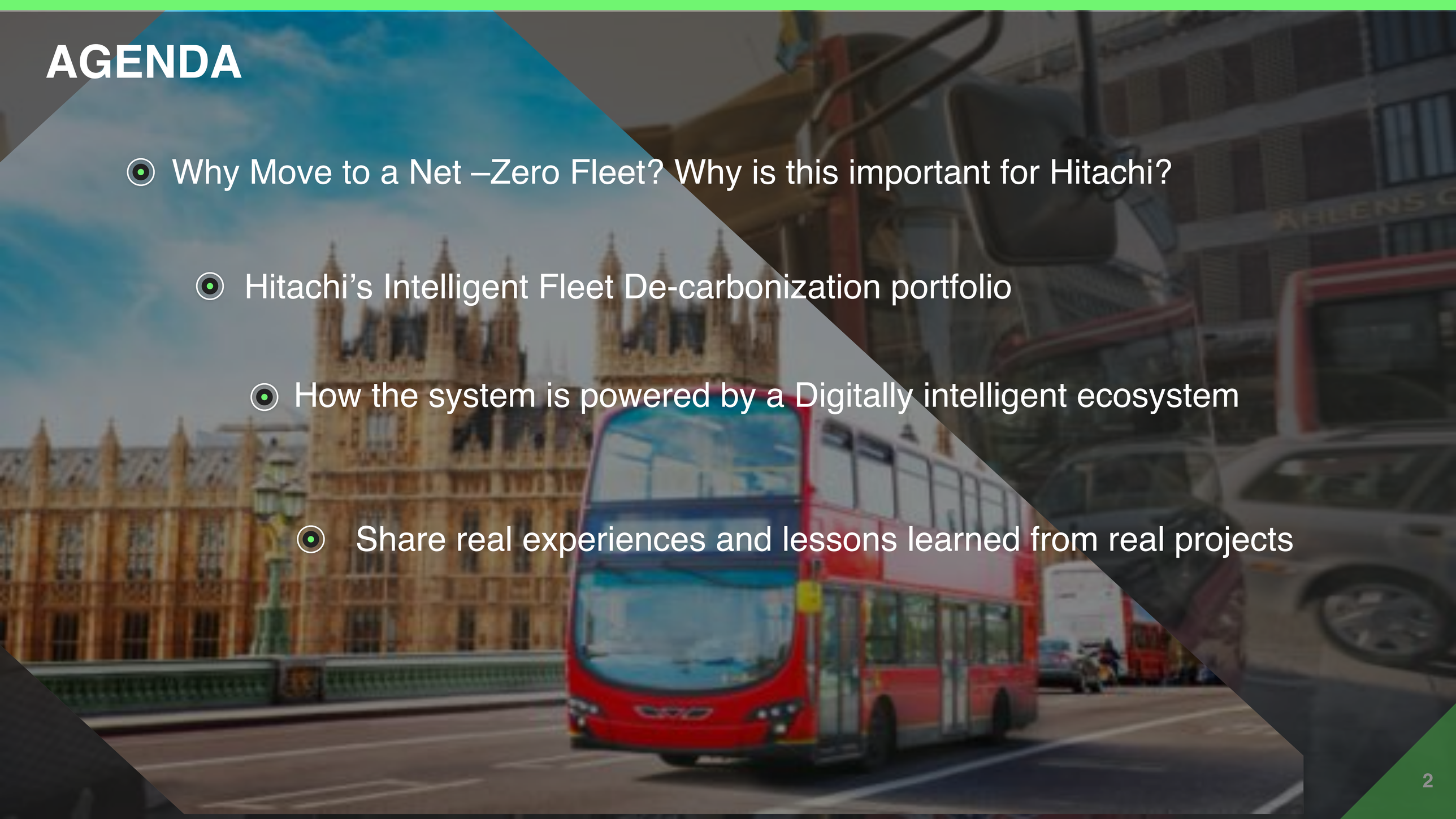
HITACHI
Inspire the Next

HITACHI

Intelligent fleet decarbonization

Monitize electrification of your fleet

AGENDA



- Why Move to a Net –Zero Fleet? Why is this important for Hitachi?
- Hitachi’s Intelligent Fleet De-carbonization portfolio
- How the system is powered by a Digitally intelligent ecosystem
- Share real experiences and lessons learned from real projects

Why Move to a Net –Zero Fleet? Why is this important for Hitachi?

NEED FOR A GREENER ECONOMY

- EU aims to be climate –neutral by 2050. Economy with net zero green house emissions
  - Forcing companies to act and change
  - Decarbonization is no more a choice but a must do for organizations
- Automotive transportation is going through a revolution, advanced electronics is enabling electrification of complex machines and increasing automation, safety, comfort and convenience.
- Positive economic case for operators already today when looking at **total cost of ownership**. Higher energy efficiency of electric vehicles, a lower lifetime maintenance cost, and continuously decreasing battery prices.
- Business as usual is no more a possibility else we will need more earths to live in if we continue in the same model

Inspiring the next, with purpose

Current carbon emissions from the global ICE bus fleet is

138M

TONNES OF CO2 PER YEAR

=

14B

GALLONS OF DIESEL CONSUMED

38

COAL PLANTS RUNNING FOR 1 YEAR

Decarbonising the global total fleet will save

101M

TONNES OF CO2 PER YEAR

=

21,000

WIND TURBINES RUNNING FOR 1 YEAR

1.6B

SEEDLINGS GROWN FOR A DECADE

WHAT COMPLEXITY ARE WE SOLVING

OUR VENTURE VISION

INSPIRE THE NEXT

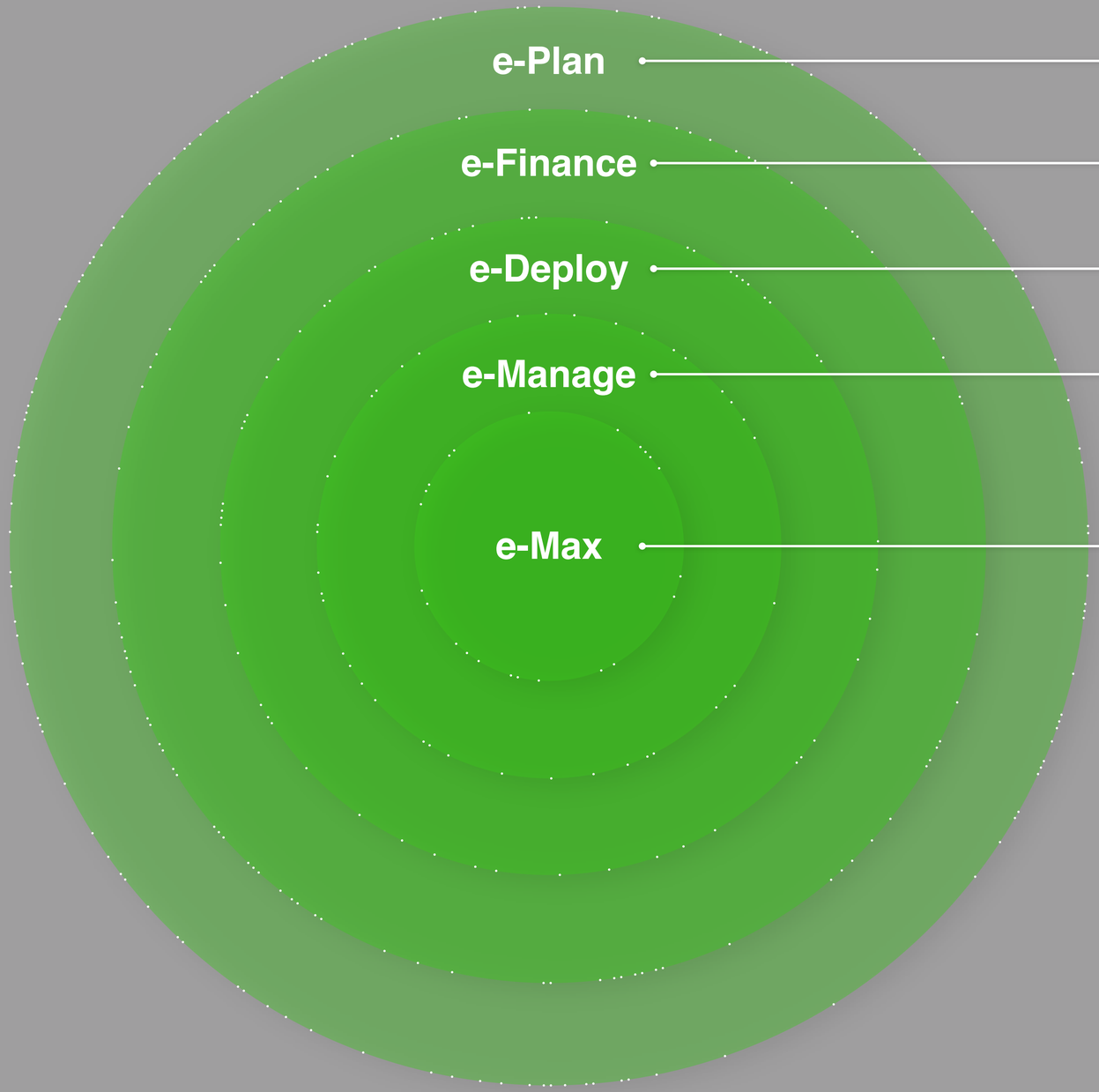
GENERATION OF ZERO EMISSION EV'S AND DEPOTS

HITACHI E-PARTNERSHIP

A modular and integrated offering to enable a decarbonised, profitable, and connected future.

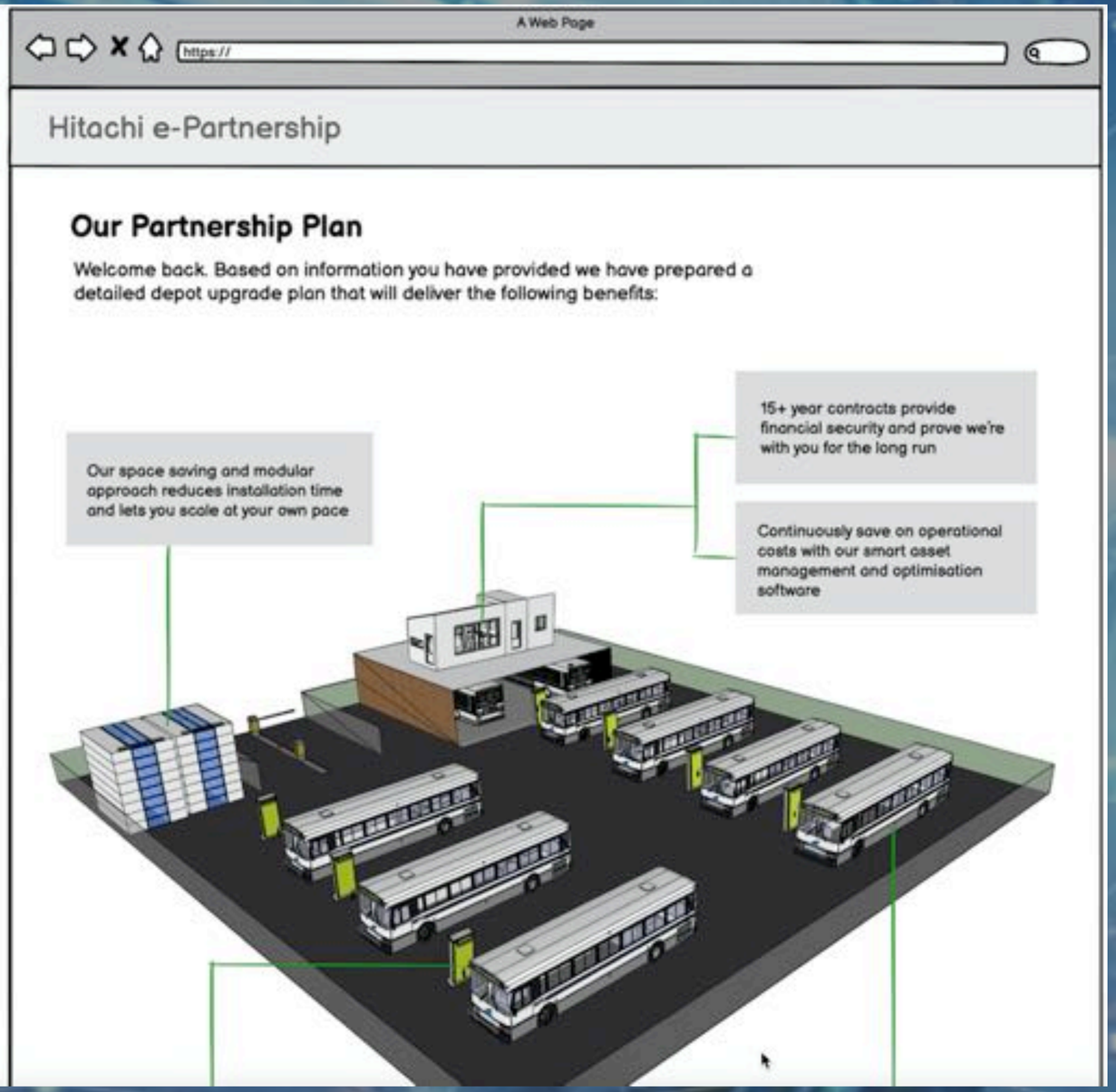
Hitachi’s Intelligent Fleet De-carbonization portfolio

OUR SERVICE VISION



- **e-Plan**
  - Energy & Decarbonization transition planning
- **e-Finance**
  - Flexible financing options
- **e-Deploy**
  - Grid connection and charging infrastructure
  - Electric bus provision
  - Opportunity and flash charging
- **e-Manage**
  - Route scheduling and planning
  - Fleet and depot smart energy management
  - Fleet telematics
- **e-Max**
  - Second-party charging
  - Power storage and sale
  - Auto depot
  - On-site renewable generation

HOW DO WE ENABLE THIS TRANSITION

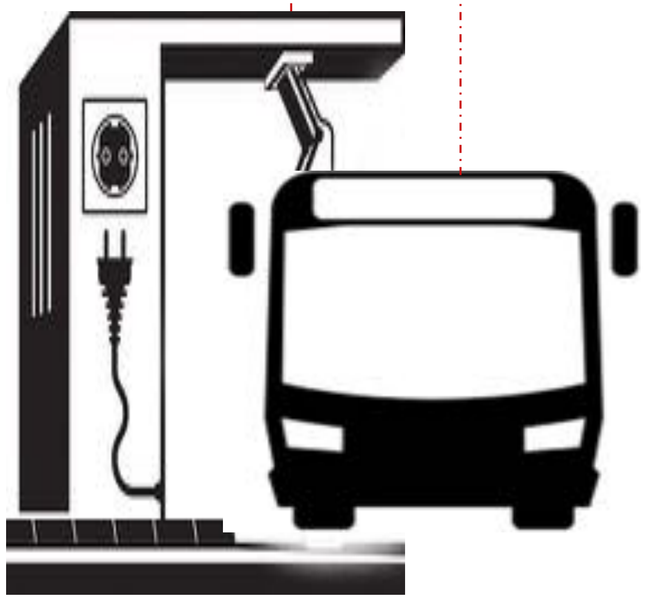


Depot Optimization & Charging

Network

BESS

Energy Source



Maintenance

Operational

Utilisation

FMS/Telematics

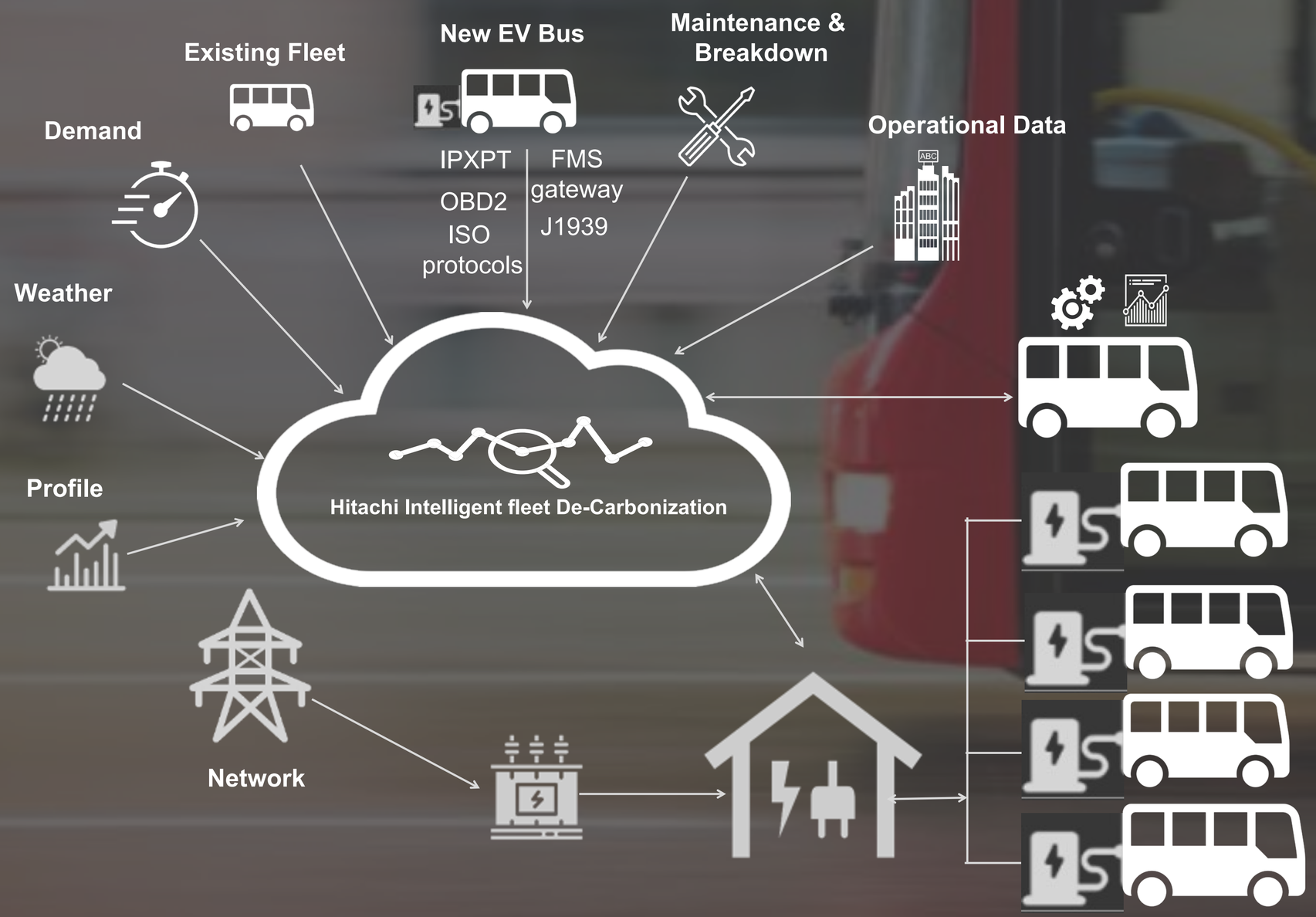
Modular architecture to build the perfect customer centric proposition

€ € €

Monetizing your Fleet & route to decarbonize

How the system is powered by a Digitally intelligent ecosystem

ENABLING DIGITAL PORTFOLIO



WHAT WE'RE DE-RISKING

Optimal Fleet — Higher Fleet Utilization

Ready fleet for the future — Connected Fleet, Low Downtime

Delivering class leading emissions — EVaaS Green Fleet

Managing the cost model — Cheaper Maintenance costs

DATA ARCHITECTURE

Presentation layer

Actionable insights, smart scheduling, simulated scenarios

Diagnostic outcomes | Predictive outcomes | Prescriptive outcomes

Compute layer

Data modelling | Knowledge graph | Inference engine | Machine learning

Data storage layer

Owned silos | Third-party silos

Structured and unstructured edge data layer

Mixed fleet telematics	Fleet dispatch system	Maintenance schedule and history	Topography information	Manufacturer product data	ERP	Network data	Energy forecast data	Grid telematics	Energy pricing	Depot incident management
Fleet and depot sensors	Current route scheduling and timetables	Live traffic and weather	Passenger activity	Public procurement/tender logs	Charging infrastructure RTUs	SCADA	Third-party EV operator data	Onsite battery storage data	Renewable energy supply telematics	Parking sensor data

HITACHI SMART ENERGY MANAGEMENT

Load Balanced

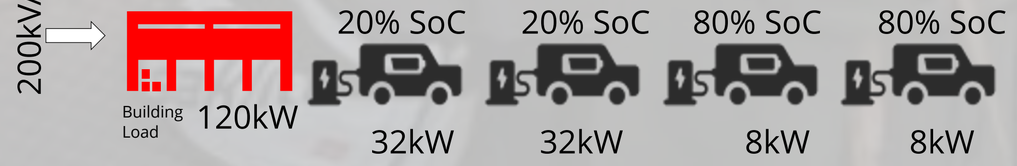
Which vehicles are plugged into which chargepoints

Adapting setpoints, based on vehicles plugged-in and changes in building load

Tariff throttling

- PEAK TIME – REDUCE EV LOAD BY 30%

"Fleet Prioritised - SoC"



"Realtime Optimisation of the interaction between the energy profile of a site and fleet which is based there"

HITACHI FLEET OPTIMIZATION

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Higher Fleet Visibility & Availability

1

Optimal Fleet

Reduce revenue loss with increased fleet availability by having visible data

Improved Fleet Utilisation

2

Managing the Cost Model

10% anticipated increase in related revenue through improved asset uptime

Reduce OPEX & CAPEX Costs

3

Reduce cost of Maintenance & Deliver Class Leading Emissions

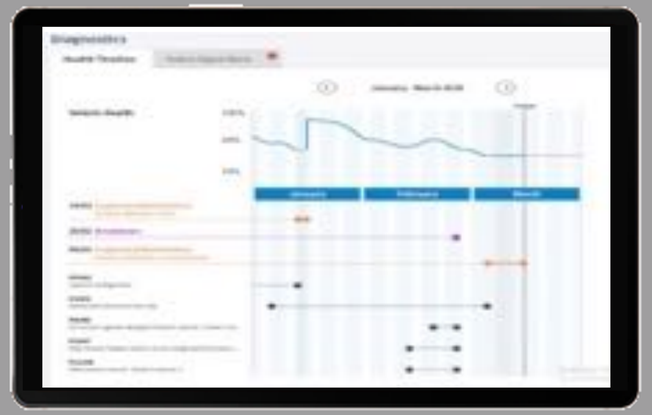
15% - 20% anticipated reduction in operational maintenance costs, as well as reducing future CAPEX

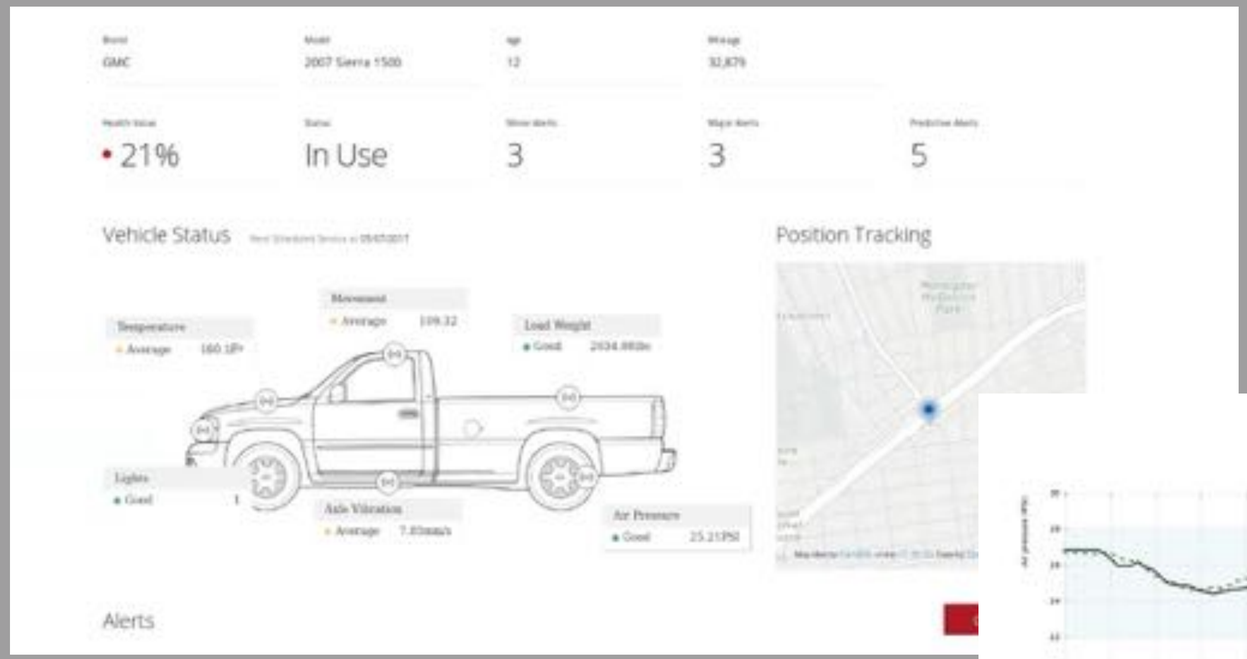
Better Decision Making

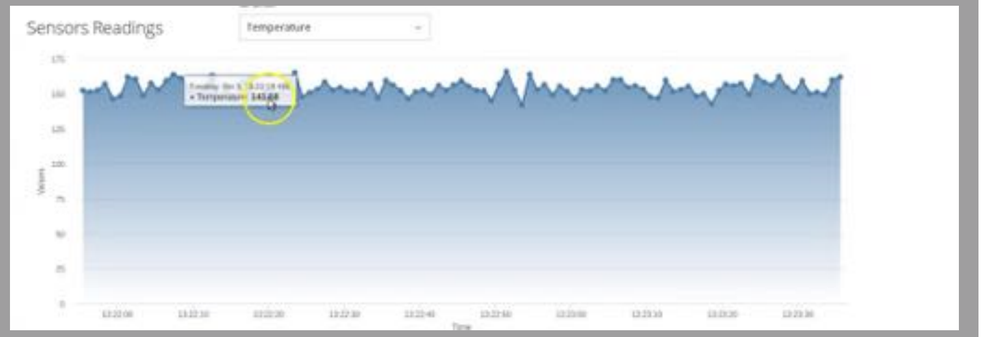
4

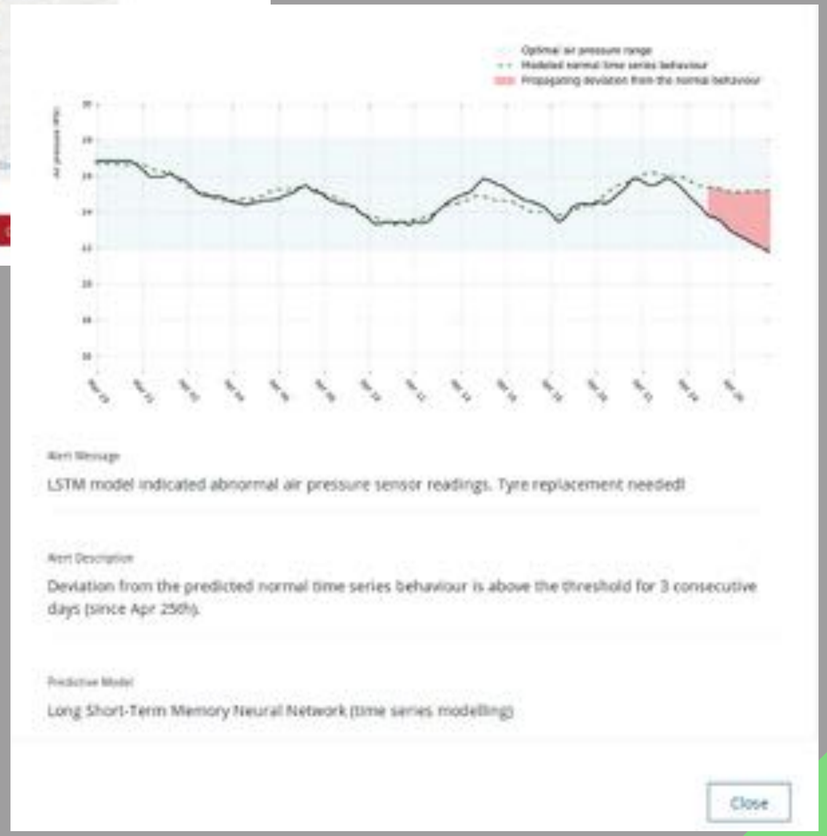
Ready the Fleet for the Future & Promote Branding

PREDICTIVE HEALTH ANALYTICS & BATTERY MANAGEMENT

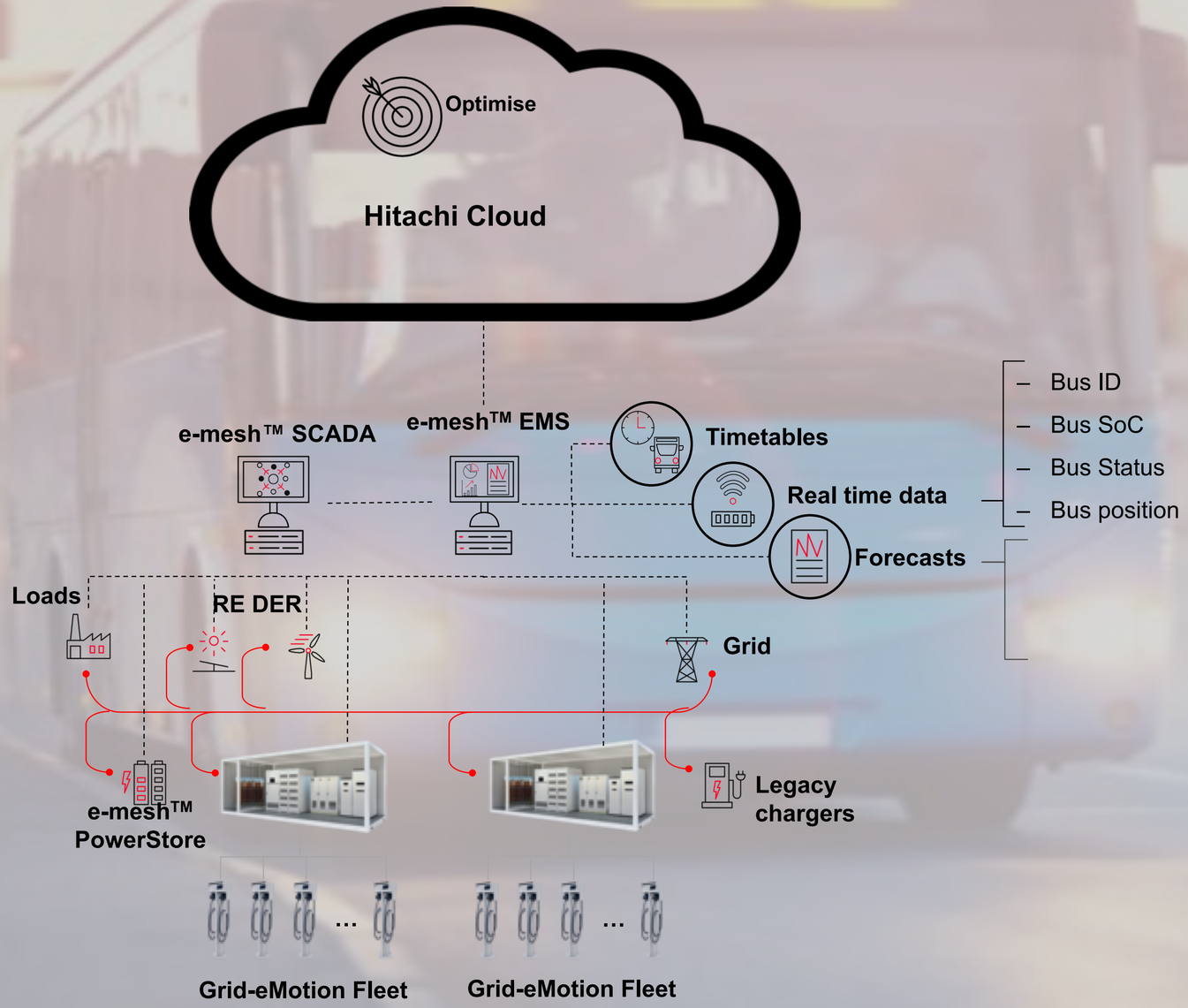








INFRASTRUCTURE MANAGEMENT



- Minimize OPerating EXpenses through day-ahead and intra-day optimal dispatch
- Accurate forecasts of renewables power generation and loads power consumption automatically updated, imported and managed by intra-day, day ahead simulation / optimization
  - Prioritize and control the charging of the EV fleet according to energy price and time schedule, e.g. considering the time needed to fully recharge or precondition the vehicle
- Assignment of EV charging station and parking spot
- Limit the overall power demand at the grid, enabling the integration of renewables at depots

Share real experiences and lessons learned from real projects

KEY CHALLENGES TO ADDRESS WHILE TAKING ON THE DIGITAL JOURNEY

Disconnected Environment

- Machines are not connected
- Every mode of transport functions differently
- Data challenges with legacy systems

Data sits in Silos

- Data sits in a **highly heterogeneous environment,** a large variety of machine types and OEMs that speak proprietary protocols (**OT Data Silos**)
- **Data from different departments** across telematics, asset information, planning, repair shops, to insurance sits in its own databases (**IT Data Silos**)

Difficult to Calculate ROI

- Most IoT projects failed due to **lack of understanding of OT business drivers** and focus too much on technologies
- **88%** of survey respondents list **“Uncertain ROI”** as the largest only non-technical barrier

Business Transformational challenge

- People don’t like changes
- How do we ensure technology adoption and embrace

Cross pollination of knowledge *between various Hitachi Business is our key to a success solution*

QUESTIONS

Get in touch

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Hitachi Social Innovation is
POWERING GOOD