

Transitioning Depots to Net Zero

Hitachi ZeroCarbon's service delivers a holistic, financed, data-driven approach to help public and private sector fleets and depots transition sustainably and efficiently to net zero through on-site energy generation, smart charging, and battery storage services.

THE FINANCIAL CHALLENGE FOR PUBLIC FUNDERS, DEPOT OPERATORS AND FLEET MANAGERS

Up-front costs of electric or hydrogen vehicles, plus installing charging infrastructure and reinforcing grid supply, can be significant. Although the operating costs of EVs (Electric Vehicles) tend to be lower than for ICE (Internal Combustion Engine) vehicles, there is still often a barrier to gaining finance for initial investment in vehicles and infrastructure and this is slowing the pace of decarbonisation.

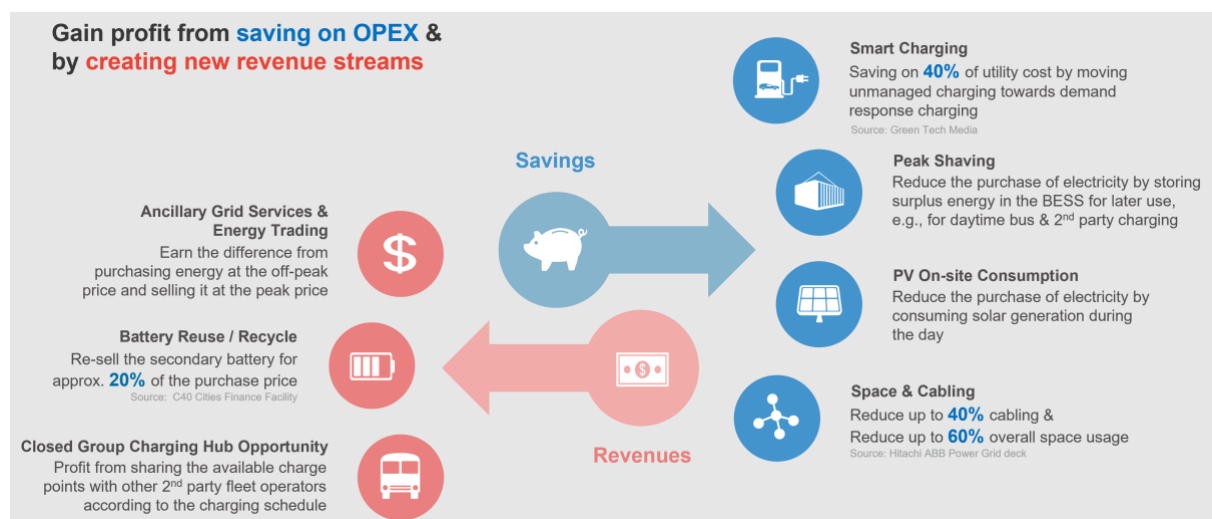
To make investment decisions quickly and with enough certainty, it is necessary for organisations to try and model the costs and pathways to transition. Modelling the Total Cost of Ownership, or TCO, for transitioning fleets, depots and operations to electrification and other sustainable fuels can indicate that there is a greater cost to achieving net zero than remaining as-is.

Although government policy is supportive and tax incentives are available, lifetime costs of investing in decarbonisation are frequently unknown for companies and this means they may struggle to finance their plans. It also means that governments and public bodies struggle to invest sustainably in infrastructure and vehicles and are unable to create holistic plans to transition whole enterprises, cities, or regions, as the cost of doing so would be unrealistic. They therefore miss out on the economies of scope and scale that could be gained. The result is a patchwork of small investments which cannot deliver maximum benefit or efficiency, and slower progress.

This is acting as a major barrier for achieving net zero as quickly as is required to meet Paris Agreement commitments.

As an example of this, Transport Scotland recognised the need for a different financial approach to decarbonisation. In its recent EV Charging Infrastructure Report it states: *'Where it is possible to do so, private and public capital will need to be jointly deployed to support the roll out of charging infrastructure for all and increase investment totals. Developing these linkages and accessing the additional capital investment which it brings will considerably assist Scotland in boosting the numbers of public electric vehicle charge points. It will also allow public bodies access to additional skills and resources to assist with network planning, operations, maintenance and asset replacement.'*

THE EMERGING OPPORTUNITIES FOR REVENUE-SUSTAINABLE DECARBONISED DEPOTS



NEW REVENUE STREAMS

Batteries within EVs and dedicated storage batteries can be used to accrue energy surplus, which can then be traded on the market to offset the costs of energy and can generate further revenues. On-site renewable energy generated can be stored for sale at a peak price.

Batteries can be re-used in battery storage systems or can be resold for 20% of the original purchase price.¹

Transforming depots and infrastructure from cost centres to profit centres through provision of EV charging infrastructure to 2nd and 3rd party fleets is a game changer, hugely reducing payback times on initial investment. This in turn opens up wider and cheaper opportunities to finance projects, improving access to capital.

The creation of **strategic charging hubs**, whereby organisations make their vehicle charging infrastructure available to other users (either in other organisations or even the public), provides an opportunity to make the most efficient use of both private and public investment in infrastructure by sharing its use across different organisations' fleets and private vehicles. It de-risks investment in infrastructure by ensuring certainty of charging through future contracted use and generates revenue by leveraging spare charge point capacity.

This enables infrastructure owners and investors to recoup investment more quickly and leads to a guaranteed income stream, de-risking and removing a major barrier to investment in decarbonisation and net zero attainment.

Closed group charging hubs are also an option, where only specified user groups can access infrastructure and it is not made available for public use. Participating depots or sites will benefit from right sized infrastructure, avoiding the need for the complex management systems which would be required to manage multi-party charging.

¹ Source: C40 Cities Finance Facility <https://cff-prod.s3.amazonaws.com/storage/files/OUfjGtaTa9DvErsxOvtsRUqWyVhy8223rwzGhclQ.pdf>

TECHNOLOGY-ENABLED COST SAVINGS

There are further opportunities for vehicle and infrastructure owners and investors to leverage emerging technologies such as Vehicle to Grid (V2G) capability, which is used to reduce energy costs by using EV batteries as storage and releasing energy back to the depot to reduce peak consumption (known as peak shaving). Smart charging of vehicles reduces your costs significantly by optimising

These new opportunities transform the depot into a revenue generator rather than just a cost centre.

energy consumption, and combined with close tariff management, enables you to shift towards demand response charging². Critically, these activities also reduce net energy consumption, and its attendant carbon emissions.

Generating renewable energy on-site using infrastructure such as solar PV (Photo Voltaic) panels, wind turbines or biomass heat generators also provides the opportunity to accelerate transition to EVs and meet the increased energy demands that go with it. In combination with battery storage, it can support peak shaving, or with

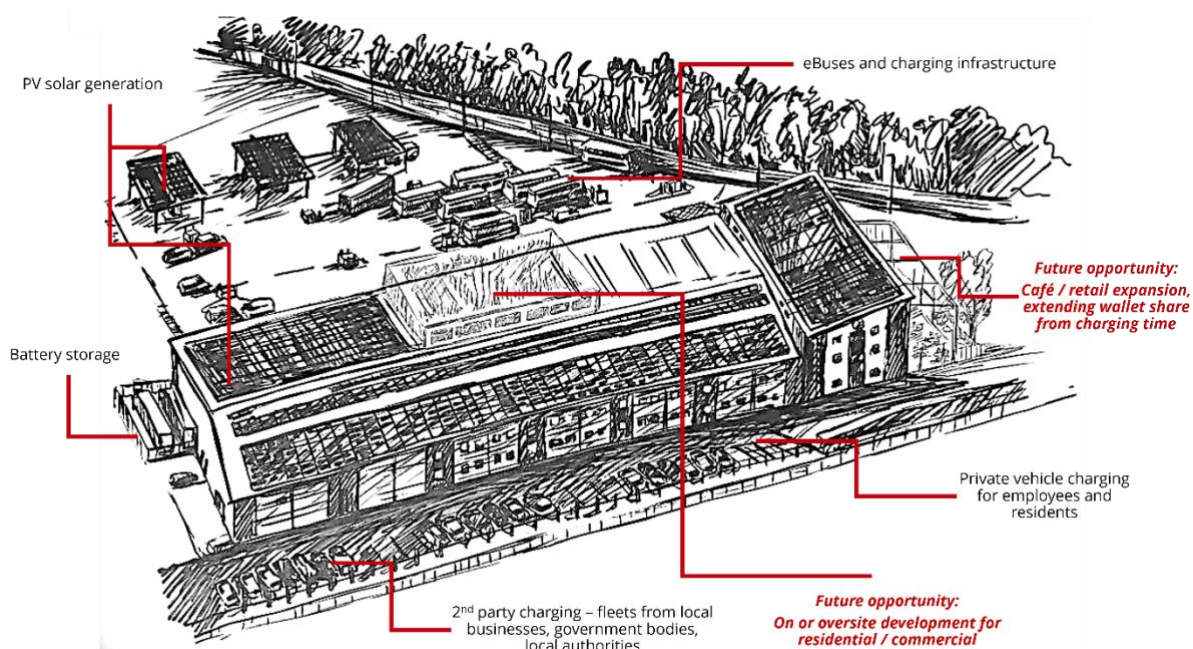
smart tariff management it can offset energy costs. Meeting increased energy demand through renewable sources keeps carbon emissions that might otherwise be associated with a switch to EVs to a minimum.

Secondary cost savings then emerge through the reduction in need for cabling and space, as smart charging improves charge point utilisation and so fewer are needed. Hitachi ABB Power Grid containerised power solutions dramatically simplify installation and save valuable space in tight depots, minimising installation time, reducing cabling by 40% and taking up 60% less space.

These technologies are all underpinned by software platforms that support the management of energy and charging infrastructure, as well as analysing and reporting on the data they generate.

² The Office for Energy explains: 'Demand response provides an opportunity for consumers to play a significant role in the operation of the electric grid by reducing or shifting their electricity usage during peak periods in response to time-based rates or other forms of financial incentives.' Source: <https://www.energy.gov/oe/activities/technology-development/grid-modernization-and-smart-grid/demand-response>

THE ESTATE OF THE FUTURE – FURTHER OPPORTUNITIES TO MAXIMISE NET ZERO DEPOT VALUE

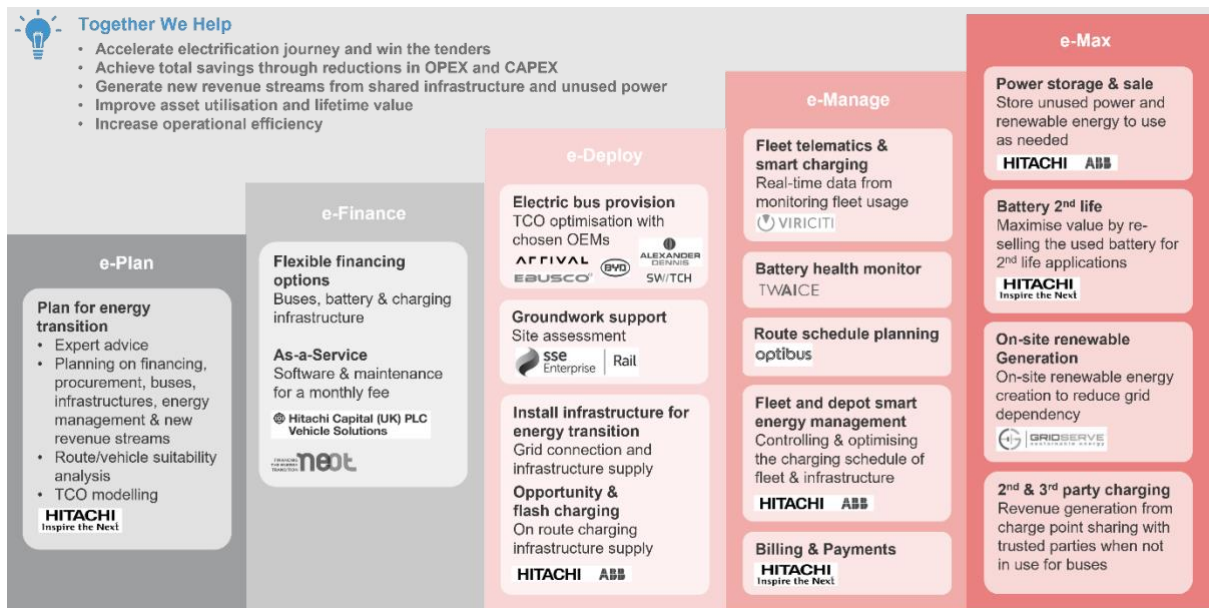


Net zero depots of the future will offer the ability to generate additional revenue streams from their assets. Quieter, zero emission electric vehicles mean depots can be used for other purposes, for example retail, or even commercial or residential use. Apartments, cafes, and shops can be built within or over them, saving space which would otherwise be needed to build them, and providing opportunities to create jobs and homes from putting infrastructure to multi-use. They have the potential to act as hubs to enhance the health, wellbeing, and economic opportunities for their communities.

TAKING AN INTEGRATED APPROACH TO DECARBONISATION

When Hitachi looked at the issues that organisations seeking to decarbonise were grappling with, they realised that they were perfectly positioned to support governments, local authorities, and private organisations through the journey to minimise carbon emissions. Hitachi has over a 100 years' knowledge of the automotive industry, 25 years of fleet management experience, over 50 years in IT solution development and systems integration, and is a pioneering technology leader in grid to plug infrastructure, V2G and smart charging technologies. Hitachi decided to combine this knowledge and experience to create an offer called Hitachi ZeroCarbon.

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Hitachi ZeroCarbon’s service is designed to de-risk the net zero journey by working with you to create a Total Cost of Ownership (TCO) model for the entire decarbonisation project. This TCO model uses existing fleet, energy, and infrastructure information to prioritise which vehicles to replace first, suggest appropriate replacement electric and hydrogen models and advise on the required charging infrastructure and energy optimisation. The TCO model also generates a business case, calculating when a return on investment can be realised, which can be used as the basis for attracting and structuring affordable and sustainable finance to deliver the plans. We will also work with you to achieve quick wins in line with your sustainability goals, delivering early value to the organisation and supporting further investment decisions for the remainder of the transition. At all times we will make sure that you can take full advantage of any government subsidies or incentives for electric vehicle purchase, charge point installations and any others that are introduced.

As well as modelling the TCO, Hitachi can also offer data-driven modelling to inform other decisions critical to planning for decarbonising and achieving net zero:

- **Charge points scenario modelling**, to identify the optimal configuration, type, location, and number of EV charge points to install to meet short-, medium- and long-term decarbonisation goals
- **Energy management modelling**, to assess the art of the possible for investing in solar, renewable energy generation and battery storage
- **Technology strategy appraisal**, to assess transport technologies (ICE, EV, Compressed Natural Gas, Fuel Cell Electric Vehicles) and examine suitability of technologies for their specific purpose, payloads, duty cycles and route
- **Site triage**, to identify energy capacity headroom at a site which is available to support EV charging and headroom at the supply substation that can be available for site grid upgrade

Hitachi is able to deliver these services due to its capability in data science and data interoperability, delivered through its Common Data Platform. This platform underpins the services above which can deliver and continually improve decarbonisation for your organisation. Fully interoperable and system-agnostic, it can take data from other platforms, for example charge point management systems and energy management systems, and process it so it is able to be analysed, reported and modelled. Reports and analysis can then be used to understand the efficacy of previous investment and transition activities, and predict and improve future decarbonisation investment and actions. The deeper learning and understanding that such a platform unlocks for organisations will be invaluable in accelerating the pace of progress to reduce carbon emissions and move to true net zero societies.

Hitachi has the capability and experience to design, deliver and finance the entire net zero depot transition project, including advising on prioritisation, phasing and vehicle choice, sourcing and procuring the vehicles and infrastructure, designing and installing charging, energy generation and storage infrastructure, managing and optimising charging and billing, delivering the IT management system that will provide a dashboard to optimise your entire transport and energy ecosystems, constantly horizon scanning to keep abreast of new technologies as they emerge, and financing the entire project to minimise up front capital expenditure and de-risk. The service is customisable so you can choose the elements you require, and we will work collaboratively with you to develop the solution that is right for your organisation.

PROCUREMENT, DESIGN, AND DELIVERY

Hitachi has negotiated partnering agreements with OEMs (Original Equipment Manufacturers) to provide fleet managers with the most extensive range of efficient EVs. Through Hitachi Capital we have a market leading financial proposition for vehicle financing, and we are confident that we can deliver the best priced deals in the market through our long-term partnering model.

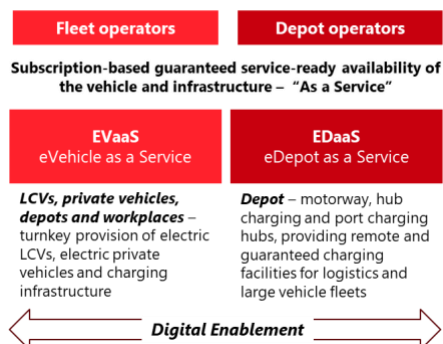
Hitachi will provide an experienced single point of contact Project Manager for delivery of all required depot works including any required construction work, optimal siting of charging infrastructure components, any required grid reinforcements, or changes to supply agreements, and utilising our excellent working relationships with Distributed Network Operators (DNOs) to enable you to benefit from the best tariffs available. We offer a complete range of AC and DC charging solutions for depot and home charging which we will design to meet your specific business needs, as well as providing any electrical and civil works required to install them.

Hitachi has made a substantial investment in GridServe to deliver ultra-fast charge Electric Forecourts that use sustainable energy for charging vehicles on route. We can provide charge cards for drivers to allow fleet operators to pay for on route charging as well as install charging points at drivers' homes if that is the best charging option for some or all vans. We can also provide consolidated billing across these charging options.

Hitachi can help drive holistic decarbonisation by delivering an "As a Service" end-to-end solution covering the physical assets (vehicle, charging infrastructure, batteries, energy generation infrastructure), operational and maintenance services enabled by digital solutions, to meet client sustainability goals.

CONCLUSION

Our Solutions



Hitachi ZeroCarbon's partnership approach is central to our wider corporate strategy. Social Innovation is all about delivering economic, environmental, and social value and the environment is a central pillar of our focus as an organisation. Delivering real value to society through our solutions is key – improving societies through better solutions that deliver greater quality of life. We do this by leveraging Hitachi capabilities across finance, mobility, infrastructure and digital to build new opportunities for cost savings, CAPEX reduction and new revenue generation through new services and solutions.

We recognise that public bodies are under pressure to help deliver climate and emissions targets and support businesses in doing the same. At the same time, government pressure and incentives are increasing to drive down carbon emissions to meet global environmental commitments. The

public also tend to support decarbonisation for social, health as well as environmental reasons. This is a 'perfect storm' of reasons to start migrating to net zero operations sooner rather than later.

The road to net zero is however not straightforward and requires new skills and understanding. Finding a suitable long-term partner with the appropriate broad experience and financial strength, to support public bodies through the transition process from strategic planning to realisable saving is vital. With its unparalleled experience of providing IT business solutions, capital financing and long term, risk sharing partnerships, Hitachi is the partner of choice for organisations to plan, manage and share the risk on the path to net zero.

Finding a long-term partner with the appropriate broad experience and financial strength is key.

NEXT STEPS

To find out more about how Hitachi ZeroCarbon can help your organisation make a successful transition to decarbonised operation, please contact:

Mike Nugent

Mike.Nugent@Hitachi-EU.com

[07788 153692](tel:07788153692)