According to research by the International Energy Agency (IEA), a significant part of the total energy-related CO2 emissions in 2035 are already “locked-in” by the existing capital stock. This means that the World is increasingly tied to large investments that move us further away from the emissions trajectory required to limit the average temperature increase to 2ºC above pre-industrial levels by 2035. Many of these large, rigid investments are in the energy and industrial sectors. Transport, on the other hand, with its relatively short lifetime of energy-related capital stock, is more flexible and thus one of the main sectors targeted by public policy when it comes to introducing less carbon intensive technologies.

Notwithstanding the sector’s decisive role in any strategy that seeks to reduce overall greenhouse gas emissions, transport has proved to be one of the most problematic sectors at a time when global CO2 emissions are rising at the quickest rate ever. In fact,
with the increasing mobility of citizens and goods and the significant cost penalties of alternative powertrain technologies, the sector faces continuing challenges to significantly curb emissions.

If the major changes set to occur in the EU’s urbanisation rate (81% in 2035 from 74% in 2009 according to the IEA) and in car fleets (287 million in 2030 with a 28% increase from 2010 according to CE Delft) are not managed in a sustainable manner, then we can expect further traffic congestion and added pressure on roads, parking and emissions. But change towards greater urbanisation could also provide benefits if the population growth is managed sustainably. Encouraging managed growth within cities along with corresponding employment opportunities will assist in greater utilisation of existing public transport and cycling facilities due to convenient proximity to the workplace.

Significant improvements in CO2 emissions and congestion require addressing the use of the private car that continues to grow notwithstanding falling sales of new cars. With research pointing towards a decreasing rate of improvement in fuel economy of the internal combustion engine (ICE) from 2020, focus is bound to shift from the ICE to alternative technologies, some of which still partially based on the ICE (hybrids).

The long-term solution is clearly to increase the use of public transport. In city centres, this can be achieved by improving the quality of door-to-door public transport while outside city centres the cost-benefit analysis of investing in public transport will most likely lead to a combination of private and public transport.

Meanwhile the traditional approach based on the investment in physical infrastructure has reached its limit. Although past infrastructure investments have partially accommodated the growing mobility demand by citizens and organisations, they have been unable to effectively address rising congestion and emissions in many metropolitan areas. Overwhelming opinion is that the current cost of new road infrastructure largely outweighs the benefits in congestion reduction.

As a result, one of the major changes set to occur will be the shift from policy essentiality based on incentives to policy that combines incentives with restrictions and aggravated price penalties. The additional revenue, together with a portion of the financial resources traditionally allocated to the construction of new roads, tunnels and bridges will increasingly be allocated to financing public transport systems. Simultaneously, in order to optimise the use of the pre-existing infrastructure, investments must be made in mobility management systems that integrate information from citizens, public transport providers, motorists, roadside sensor systems, traffic lights, etc. With substantially lower investments, these systems can deliver significant improvements.

From the user’s point-of-view, information and communication technologies will continue to empower individuals by giving them information on the alternatives on how to go from point A to point B. Moreover, real-time, two-way exchange of information between citizens and mobility service providers will enable a growing number of flexible links in the transport chain (e.g. car sharing, bike sharing or demand responsive public transport) with supply moving closer to the individual needs of the user.

Inside the car, major changes are also set to occur with mandatory eCall in all new passenger cars and light duty vehicles in Europe as of 2015. eCall supporting technologies include an in-vehicle telematics platform, allowing localisation via the Global Navigation Satellite System as well as the wireless communication to and from the vehicle. With minimal additional cost, these technologies are key enablers of added functionality such as navigation with real-time traffic information, remote vehicle diagnostics and infotainment.

In general terms, the major change to urban mobility will come from the integration of individual and collective mobility through real-time integration of data from citizens and private and public transport. The result is a system that enables seamless transitions between public and private transport and between different public transport modes, that generates accurate information on estimated times of arrival of vehicles and that delivers predictability and quality to the entire transport system.

Ultimately, many of these changes will require support from society for measures that will, in many cases, lead to cost penalties for CO2 emissions. On the positive side, the implementation of these measures may result in significant savings (29 billion dollars per year in 2035 according to the IEA).
in pollution control. It is therefore of the utmost importance that these savings be factored in when analysing new investments as they may have a relevant impact on the overall cost of a solution/technology.

The overall conclusion is that there is still time to change the emissions trajectories we are currently on but, the more time we delay decisive action, the costlier it will be to achieve the same results. If nothing is done, the only way to avoid these added costs is by forfeiting of a part of our quality of life and health. A more in-depth analysis of these and other issues can be found in the BATERRIE Project reports.

What to do on an Island with no fuel station?

The Island of Fetlar is one of the more remote Shetland Islands which, in common with other small islands shares similar issues. These range from severe depopulation and high cost of living to concerns over the future provision of transport for locals. To counter these challenges the community on Fetlar formed a development company, Fetlar Developments Ltd (FDL) which to date has had some significant success in addressing the key issues.

Unfortunately, the island does not have a fuel station and therefore islanders have to travel off the island for fuel, with the exception of a few crofters who have private diesel tanks. The development company has investigated the provision of a filling station, but this was shown to be unviable. As most islanders have to travel some distance to get fuel, this inevitably significantly increases both their costs and associated CO2 emissions.

When the Post office announced the withdrawal of their “Postbus” service it prompted the community to look at other options for local community transport. In particular those which minimised emissions. After careful consideration of the options available at the time, a commercially available electric minibus was selected.

The idea was simple, the island has a readily available supply of fuel - electricity, hence potential to recharge an electric vehicle. This meant that the vehicle did not have to leave the island to re fuel. As electrical power is cheaper than petrol or diesel, the operating cost reductions would help offset the
higher capital costs as well as lowering CO2 emissions.

Based on operational experience and local energy prices, the cost of energy to run the minibus equates to approximately one third of the cost of an equivalent diesel vehicle. Assistance was secured by the community in way of FDL, with the significant purchase costs of the electric minibus.

Following the acquisition of the vehicle, the Fetlar Museum Trust has looked to support the further use of electric vehicles by installing fast charging points. These are currently being installed at Fetlar Interpretive Centre.

But the plan is to go even further to reduce carbon emissions. FDL are currently working on the “Fetlar Green Energy” scheme, which will use the electricity produced by 2 wind turbines locally, to charge the minibus but also to provide a micro district heating scheme, supplying heat to the local school and a nearby house. This scheme will not only make operation of the minibus virtually carbon free but will also help to further reduce carbon emissions produced by oil and solid fuel heating systems used in the buildings. Income from the scheme will also help to make the company more sustainable.

Robert Thomson, Development Worker with Fetlar Developments Ltd, said, “We are pleased that the first phase of our project is complete. We have taken delivery of our electric minibus, which has been adapted to allow full disabled access and our small network of 3 phase charge points has been installed. We are working hard to make sure that the second phase of our project, to provide green energy, goes ahead according to plan.”

**Integrated approach to land use planning, urban design and transportation engineering**

An integrated and innovative land use transportation plan has been prepared for Douglas which is a large and popular residential suburb of approximately 30,000 persons on the periphery of Cork City in Ireland. Recently, the town centre is showing signs of increased vacancy levels and there is a major problem of traffic congestion in peak periods. The Douglas Land Use and Transportation Strategy (DLUTS) was first identified in the Carrigaline Electoral Area Local Area Plan in 2011, where it was recognised that in order to ensure balanced land use growth in the future, it was necessary to retrofit a modern transportation network, in particular focusing on a major shift towards other transport modes in line with the national priority of Smarter Travel.

The overall aim of the DLUTS is to ensure that there is an integrated approach to land use planning, urban design and transportation engineering for the future development of the town. Specifically, the goals of this strategy were:

- to provide a framework for future planning decisions
- optimise the traffic and transport network
- provide a guide to the investment in transport infrastructure
- identify the capacity of the town centre for additional retail and other development

The key vision for Douglas is to secure a successful vibrant urban centre with a more efficient transport network for Douglas that provides an improved public realm, reduces congestion, encourages greater levels of walking & cycling, and improves the quality of life for the community, thereby enabling sustainable future growth. A high level of consulta-
tion took place with residents and the Public Agencies Consultative Group (PACG) which included the NRA, NTA, Cork City Council, Bus Éireann, Health Services Executive, Department of Education, and An Garda Síochana.

In order to prepare a set of land use, transportation and public realm proposals, it was necessary to look at the development of alternative scenarios based on two 10 year time horizons; namely, the short to medium term (2012-2022) and the medium to long term (2022-2032). The preferred scenario, after evaluation, looked at an option to develop the transport proposals in their entirety during the first tranche so that it may create conditions for longer term growth in land use development. Obviously, the problem of vacancy is a short term issue and needs to be filled before any new development should take place. The public realm proposals should also take place at the same time as both the transport and land use proposals are implemented in order to provide a better quality townscape.

The DLUTS strategy plots out the road map that shows how all of this can be achieved without major investment and in a relatively short timeframe. The challenge to residents of Douglas is to embrace the strategy and change the way they make their day to day decisions on travel options to work, school, leisure and shopping. After final approval, this strategy’s recommendations will be incorporated into the statutory plan (Carrigaline Electoral Area Local Area Plan) by way of an amendment and the project will continue to be implemented by the local authority. Full report available online at www.corkcoco.ie

### Bilbao tests mobility system pioneer in Europe

Citizens will be able to look up traffic situation, parking and bus network in Bilbao through their mobile smart phones. The main novelty is that, for the first time, users will be able to feedback to the system to correct and improve the information collected and shared.

The City of Bilbao and the Mobility and Logistics Cluster of the Basque Country presented in early June 2013 a new service to the city: the opportunity to consult on the mobile phone, through a single application, aggregated information on traffic conditions, parking availability and bus network positioning with data coming from city sensor systems but also from the users feedback.

From now on, it will be easier to avoid traffic jams, find a parking space or check bus arrival based also on real time information form the proper users. This will be possible thanks to dynamic “feedback loop” from mobile users and travellers to the cities’ traffic management centres. These feedback is possible thanks to the In-Time Commonly Agreed Interface (CAI) that allows to connect users to traffic management centers for a regular feed of data and information. The result of this validation of cooperative mobility services will be an increased exchange of experiences amongst public authorities, TISPs (Traffic Information Service Providers) and citizens.

The real challenge of the initiative lies in the accuracy and quality of the information managed. With the addition of the data provided by citizens, it is possible to integrate in just one place all the information provided by all actors involved in the processes of mobility, not only the traffic authorities or transport operators, allowing, thus, to react to changing traffic conditions and take steps to improve mobility in urban areas.

The application is already available for Android users for Bilbao City and five other cities in Europe (Florence, Munich, Prague, Reading and Vienna).
BATTERIE has an excellent quality of partnership. First of all, each country or region within the Atlantic Area is represented – Portugal, Spain, France, Ireland, UK. Furthermore the partnership is triple helix; that is to say that we have partners in the private, public and academic sectors. The partners have a wealth of expertise in completing transnational transport, energy, smart technology and regional development projects.

Partners in the project

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