Overview of renewable energy & energy efficiency potential in Irish Public Transport

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Smart/eco-driving

- Driving techniques as taught in numerous training modules, e.g. Driver CPC Module 1 “Control of the vehicle & eco-driving techniques”
- Route selection, which takes into account highway design and conditions, e.g. less vehicle idling, less time in congestion
- Onboard systems, e.g. real time fuel consumption indicator related to driving style, acceleration control pedal
- Post trip analysis, e.g. downloading trip data, comparing driving style, route taken and fuel consumption

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Smart/eco-driving

- SEAI Management Action Programme
  - Fuel saving measures
  - Eco-driving
  - Field trials with Bus Éireann and Matthews Coach Hire
    - BÉ has achieved up to 50% savings in fuel consumption in initial trial
    - Matthews Coach Hire fleet efficiency has improved by 5.8%
- Estimation of 10.2% in fuel saving during an Eco-Driving training session of bus drivers in Athens estimated savings of €6,630,000 p.a.

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Smart/eco-driving

- Eco-driving techniques might cause problems for the whole traffic network thus impacting upon route selection.
- Extend SEAI MAP to all bus operators
- Useful information sources:
  - EcoDriver, www.ecodriverproject.eu
  - Eco-Driving Review and CO_2 Modelling for Eco-Routing, Alam & McNabola, Proceedings of ITRN Conference 2012

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Cycle based activity

- Bike Hire schemes
  - 600 towns and cities around the world
  - Approx 500,000 bicycles in schemes worldwide
  - Many of them have introduced eBikes into their fleet
  - Ireland started with Dublin Bikes in 2009, which now has 102 stations, 1,500 bikes and 3,000 stands
  - Galway launched this week
  - Limerick due to launch on 8th December
  - Cork due to launch on 18th December
- Modal shift experience: mostly from public transport rather than private car

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Cycle based activity

- Bicycle taxis/rickshaws
- Operating in Dublin, Galway and Cork

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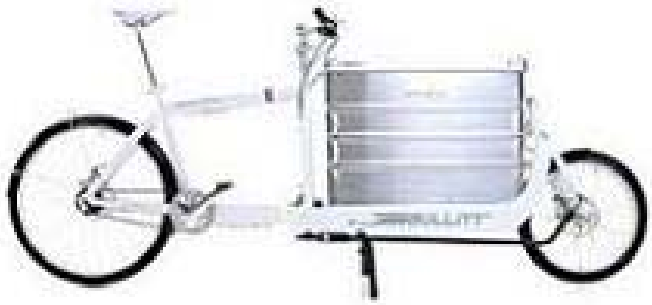
Cycle based activity

- Cargo bikes and inner city deliveries:
  - Goods delivery
  - Municipal services and small trade providers
  - Private goods transport
- Examples:
  - Cyclone Couriers in Dublin
    - part of existing courier business
  - txita in Donostia/San Sebastian, Basque Country, Spain
    - replacement of ICE vehicles for urban distribution in the centre and the Old Town
    - plan to establish a micro consolidation centre



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Cycle based activity

- Advantages of cargobikes:
  - can use a denser road network, e.g. one-way roads in both directions, bus lanes – if allowed, cycle lanes
  - needs less parking space and there are no access restrictions, e.g. to deliver in pedestrian zones
  - faster on short distances routes (up to 4 km) and especially at peak hours

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Cycle based activity

- Potential modal shift as part of urban logistics: 42% of all trips, broken down to:
  - private logistic trips, i.e. commuting, leisure & shopping – 68% of the potential for a shift
  - professional logistic trips, i.e. goods delivery, business & service – 32%

- Extend Bike Hire Schemes to smaller towns
- Introduce eBikes and Cargobikes into Bike Hire Schemes
- Encourage the establishment of bicycle taxis in more places

- Useful information sources:
  - CILTI Cycling Policy
  - www.cyclelogistics.eu

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Car based activity

- CarSharing/Car Clubs
  - Originated in Switzerland in the late 1980s
  - Estimated 2m customers in about 30 countries
  - “Hassle free” rental by the hour with all inclusive charging structure; vehicles based throughout the urban areas; one way hire possible
  - In Ireland since 2008 (Cork) and 2010 (Dublin) under GoCar brand

GO CAR drive different

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Car based activity

- EVs in Carsharing fleets

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Car based activity

“Mixed eUse”:

- The Croatian cities of Biograd and Koprivnica have launched new charging facilities for electric vehicles.
- Electric vehicles, bicycles and even laptops and mobile phones will be able to re-fuel at **Biograd's** new multi-purpose electric charging station.
- **Koprivnica's** new charging stations will complement the city's recently launched car-sharing system, which includes six electric cars and two hybrid vehicles. Koprivnica plans to introduce electric buses and other forms of electrically powered public transport in the coming year.
- More details at: http://www.eltis.org/content/koprivnica-and-biograd-support-electric-mobility-new-charging-stations-croatia#sthash.iiKvmjfz.dpuf

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Car based activity

- **Dublin's first electric taxi saved approximately €6,500 over 18 months.**
- The 100% electric Nissan LEAF clocked up over 55,000km.
- Savings of up to 12.9 cent per km can be achieved by driving an electric vehicle, powered by night rate electricity, in comparison with a conventional car.
- For 55,000km, this would equate to fuel savings of over €6,500 and a net reduction in over four tonnes of CO2 emissions.

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Car based activity

What to do in Ireland:

- Croatian towns present a good example of making use of eInfrastructure
- GoCar, City Bike Schemes, SEAI & ESB (eCars) explore collaboration
- Support expansion of eTaxis

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Bus based activity

Fuel types in use:

- Hybrid diesel/battery electric
- Hybrid diesel/flywheel electric
- Full electric (plug in or wireless)
- CNG – Compressed Natural Gas
- However, the progression in ICE powered buses from Euro1 to Euro6 has seen a dramatic decrease in emissions and increase in fuel efficiency and the development of lighter buses has also improved fuel efficiency.

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Bus based activity

- Example of latest developments

Charging plates underneath the bus align with grids fixed in the road at either end of the route and top up the battery during 10-minute driver breaks; uses contactless inductive loop technology.

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Bus based activity

- 3 Optare battery-powered Solo EVs in Durham, England
- Grant from Green Bus Fund
- Operated by Veolia on behalf of Durham County Council
- Estimated to save 42 tonnes of CO_2 p.a.
- Routes include steep inclines; EVs perform better than existing diesel Solos with added benefit of regenerative charging of batteries during descents.
- 8.1m buses: 24 seated plus up to 21 standees

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Bus based activity

Useful sources of information (ongoing EU projects):

3iBS – intelligent, innovative, integrated Bus System, October 2012 – March 2015, www.3iBS.eu

LIFE BeeBus - "Electric Bus Rapid Transit: high capacity Bus with zero local emissions“, June 2014 – November 2017

The LIFE BeeBus project will test and demonstrate the eBRT, an 18m electric bus designed for quick recharging during stops at passenger stations.

EcoDriver, www.ecodriverproject.eu

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Potential local project

- Joint project on electric buses operating in Limerick, Limerick to Ennis via Shannon Airport (Bus Éireann), in Ennis and on rural service in Clare (Clare Bus)
- Include installation of charging infrastructure as part of Colbert Station redevelopment
- Support from NTA, SEAI and ESB
- Evaluation by LIT and Limerick & Clare Energy Agency

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Go raibh míle maith agaibh

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