Importance of the transport sector for energy efficiency targets

20th ENERGY EFFICIENCY COORDINATION GROUP MEETING
Vienna 18th June 2019

Experts in energy, transport & emissions.

www.aems.ie

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Agenda

- Transport context & growth
- Our choices: Avoid, Shift, Improve
- Article 7 (EEOS) in action
- Our choices in freight
  - Article 8 Challenges
- How will you know your freight policies are working
  - Smart Freight Centre, GLEC & LEARN
- Summary

AEMS ECOfleet (2005-18)

<table>
<thead>
<tr>
<th>Programme</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECOfleet EnergyMAP</td>
<td>2005</td>
</tr>
<tr>
<td>ECOdrive</td>
<td>2006</td>
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<tr>
<td>M&amp;V</td>
<td>2010</td>
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<tr>
<td>ISO50001</td>
<td>2011</td>
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<tr>
<td>EEOS-ECOfleet</td>
<td>2012-16</td>
</tr>
<tr>
<td>Training</td>
<td>2017</td>
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<tr>
<td>Smart Freight Centre</td>
<td>2018</td>
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<tr>
<td>GLEC Framework</td>
<td></td>
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<tr>
<td>Smart Transport Manager Training</td>
<td></td>
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<tr>
<td>Online apps for Art 7</td>
<td></td>
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</tbody>
</table>

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https://ecofleet.ie
https://ecodrive.ie
Context
Transport is our fastest growing emitter
What contribution does transport make in your NECP

In the 2015 Paris Agreement, virtually every nation in the world agreed to work together to achieve net zero greenhouse gas emissions.

While transport was not explicitly mentioned in the Paris Agreement, more than 61 percent of countries’ national climate plans, (INDCs) included transport . . . . transport already accounts for 23 percent of global emissions, and is the fastest-growing sector in the global economy.

What’s (not) happening with transport?

EU Road Transport – what’s out there

Policy relies on new vehicle performance improvement?

Average Vehicle Age

Growth

Vehicle efficiency has increased due to policy measures; **what is driving emissions growth?**


Energy use in freight

Slight increase 2000-2015 due to:
+17mtoe GDP growth
+2mtoe shift to road
-17mtoe due to energy savings

ITF Outlook to 2050  Published 2017, update due May 2019

Transport as a system
STRUCTURAL WASTE IN THE MOBILITY SYSTEM

CAR UTILISATION

- 1.6% looking for parking
- 1% sitting in congestion
- 5% driving

Typical European car parked 95% of time

Average European car has 5 seats but carries 1.5 people/_trip

TANK-TO-WHEEL ENERGY FLOW - PETROL

- Energy used to move people
- Net of vehicle
- Rolling resistance
- Auxiliary power
- Transmission losses
- Aerodynamics

1:1 deadweight ratio

Engine losses

86% of fuel never reaches wheels

Productive use

LAND UTILISATION:

5% Road reaches peak throughput only 5% of time and only 10% covered with cars then

50% 50% of most city land dedicated to streets and roads, parking, services stations, driveways, signals, and traffic signs

LAND UTILISATION: 5% Road reaches peak throughput only 5% of time and only 10% covered with cars then 50% 50% of most city land dedicated to streets and roads, parking, services stations, driveways, signals, and traffic signs

1 Based on car parked number for France and productivity vs. unproductive driving time in US. 2 For every death on Europe’s roads there are an estimated four permanently disabling injuries. 3 Based on average car weight of 1.6 tonnes and average occupation of 1.3 passengers of 75 kg.


Image courtesy Ellen MacArthur Foundation 2018
Space is the challenge – we have finite road space and infinite demand
Will car culture shift from ‘me’ to ‘we’*?

Under 30’s are driving less . . .

*Nathan+Partners report suggests a shift from car culture to mobility culture 14 March 2019 [Link](https://www.greencarcongress.com/2019/03/20190314-ap.html)
A strategic approach

Avoid
Shift
Improve

What can we do? A strategic approach  (ITF, UN, IEA et al)

Strategy & policy framework

1. Avoid travel
2. Shift mode
3. Improve performance

System efficiency
Trip efficiency
Vehicle efficiency

EED 2012 Art.7 and Art.8

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https://ecofleet.ie
https://ecodrive.ie
1. Avoid travel

Do you need to travel?
Is there an alternate?
Are we planning?

Who remembers the London Olympics traffic jams?

No-one – they didn’t happen due to excellent travel planning.

Travel decision tree principles, the 5R’s
Rethink
Reduce
Re-mode
Reroute
Retime

Courtesy CILT International
### Workplace travel planner (WTP made simple)

<table>
<thead>
<tr>
<th>Meet?</th>
<th>Venue?</th>
<th>Mode?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call</td>
<td>Work from home</td>
<td>Walk / Cycle</td>
</tr>
<tr>
<td>eMail</td>
<td>Office</td>
<td>Public Transport:</td>
</tr>
<tr>
<td>Video Conference</td>
<td>Decided?</td>
<td>Car</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>Use Journey Planner</td>
</tr>
<tr>
<td>Where will we reduce the distance travelled</td>
<td>When? Avoid congestion</td>
<td>Can you travel with others?</td>
</tr>
<tr>
<td>sPSV / taxi</td>
<td>Plan route</td>
<td>Who else can you meet en route?</td>
</tr>
<tr>
<td>Bus</td>
<td>Car</td>
<td></td>
</tr>
<tr>
<td>Train</td>
<td>Plan route</td>
<td></td>
</tr>
</tbody>
</table>

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### Avoiding freight: What do we ship most? Air!

- **Ikea promotional Easter egg 2019**
  - © Shutterstock / Karamba Production
  - Manage energy for profit & planet © www.aems.ie
  - https://ecofleet.ie
  - https://ecodrive.ie
2. Shift mode

What are your options?
How Public Transport can sell itself

Capacity vs use

What is your car utilisation?
- 4 seat car with one driver = 25%
- Used for 2 hrs/day = 8% (EU Average)

What is empty weight vs payload?
- When did you last empty your boot?
- How often do you plan your route?

Vans vs Artics (HDVs)
- 2t vs 20t, 10 vans vs 1 truck?
Which modes are missing from this graphic?

All are EVs, but which will reduce emissions the fastest?

Source: Oliver Bruce @oliverbruce
EU Cycle Paths

Where are we?

Where is this in your SEAP / SUMP?

Where do we cycle?

Better Data for Better Cities

Strava helps make cycling, running, and walking in cities better. Millions of people upload their rides and use Strava every week via their smartphones or GPS device. These aggregations of individual data and their partners with departments of transportation and city planning groups to improve infrastructure for cyclists and pedestrians.
Will car culture shift from “me” to “we”?

eTaxi, eBus or Shared eTaxi? Shared taxis can reduce road space requirements by 92% - ITF in Lisbon, Helsinki . . . so far

Shift exercise: use a Journey Planner

✍️ How did you get here today?
1. What alternatives are there?
   - Use your hotel/home address to here
2. Work out your costs
   - Compare to cost per km of your car (use 67c/km - AA Ireland)
3. Work out your time
   - Can you work while driving?
Company cars vs modal shift

If your company car tax plateaus at 30,000km per year
- How many km will you drive per year?
You receive expenses per km; will you use public transport?
- What needs to change?
You bussed / walked / biked to work
- How do you go to a meeting during the day?

MOBILITY SERVICES FROM BMW AND DAIMLER
UNDER ONE ROOF

Copyright BMW Group and Daimler AG
3. Improve performance

Improve the fuel and emissions performance of your existing vehicle(s)

Why should you manage fuel

<table>
<thead>
<tr>
<th>Business case</th>
<th>Example</th>
<th>Your figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy / fuel spend (approx.)</td>
<td>€ 1,000,000</td>
<td></td>
</tr>
<tr>
<td>Typical/projected savings</td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>Potential saving over 3 years</td>
<td>€ 100,000</td>
<td></td>
</tr>
<tr>
<td><strong>Potential saving over 1 year</strong></td>
<td>€ 33,000</td>
<td></td>
</tr>
<tr>
<td>Profit (or non-pay budget) last year?</td>
<td>€ 90,000</td>
<td></td>
</tr>
<tr>
<td>Savings as % of profit or budget per year</td>
<td></td>
<td>37%</td>
</tr>
<tr>
<td>Sales or work needed to make same profit</td>
<td>€ 1,100,000</td>
<td></td>
</tr>
</tbody>
</table>
Slow down, save money, CO₂ and lives

6.5L/100km @ 120kph

3.1L/100km @ 100kph

Always obey speed limits: Typical saving 25% (120-100kph); limit yourself to 110kph to add 100km per tank. Based on my experience in Ireland over 60,000km in 141 VW Golf 1.6tdi averaging 800km per tank normally.

70% of your fuel cost is wasted in heat and exhaust

20% Moves you around

ICE Losses - EU EEA 2016

How much do you spend on fuel per week? €50 x 50 wks = €2,500/yr i.e. €2,000 is wasted to heat
Working EV vs diesel

Diesel @ 4.9L or 49kWh/100km  EV @ 15kWh/100km

Your experience with transport in EEOS

From your Art.8 Energy Audits:
- How many EV's procured to date?
- How much energy have you saved?
- What are the barriers?

How many energy credits do your Art.7 schemes (EEOS) give to:
- Avoiding travel?
- Consolidating deliveries?
- Modal shift
  - from car to public transport?
  - From car to bicycle / walking
- Diesel to Electric replacement?
Mobility Lessons EEOS; 2012 to date

Article 7 and Article 8 to 2030

- Avoid travel
  - Recognise working from home and video conferencing
  - Identify opportunities to save in Energy Audits

- Shift mode
  - Recognise savings from switching car to train & bus
  - Pay expenses at same rate regardless of mode

- Improve performance
  - Recognise diesel to EV savings as final energy
  - Educate public and government as to where waste lies – inform choices

Freight in EEOS (Art.7)

ECOfleet™ programme funded by Enprova (95% of oil industry in Ireland)
Funded under EEOS – Art.7 of EED 2012 in action
80 fleets engaged 2012-2019
Approx. 5,000+ vehicles & drivers
Save fuel: get paid

1. Business Case
   - Allocate time

2. Opportunities
   - Keep records

3. Action Plan
   - Feedback Weekly

Quarterly Report: Enprova Funding

Vehicles, Drivers, Scheduling, Routes

What can one business or fleet do?

- Fuel Management
- Weekly Driver Feedback
- ECOdrive training
- Aerodynamics retrofit
- Speed limiters reduced
- Detail Maintenance (batteries, tyres, oils)
- Buy new vehicles

Weekly L/100km year on year - ECOfleet HDV customer Year on Year
Example Payments under EEOS (Art.7)

- Total paid out: €100,389
- Smallest payment: €1,035
- Largest Payment: €16,718
- Average Payment: €7,700
- Total Litres Saved: 2,641,789L

Smallest fuel saving to one company was 16,000L and largest monetary saving to another company was €498,000.

Public Sector fleets have received payments and benefits in kind e.g railways received telematics hardware and software services.

Annual Performance Certificate

GLEC Declaration planned for 2019

- Can be funded as part of EED 2012 Art.7 Enprova funded ECOfleet

Designed to show how well you are managing fuel and CO₂ emissions

- Without revealing commercially sensitive information
- Can be used to engage 3rd party hauliers
- Can be used to secure business by hauliers
"Everything should be made as simple as possible, but not simpler."

Albert Einstein

Art. 7 EEOS platform [https://ECOfleet.ie](https://ECOfleet.ie)

5 Step programme
1. Business case
2. Where are you
3. Opportunity score
   - Self service fleet audit (voluntary)
4. Action plan
5. M&V

Ready to go online app
The EU freight challenge

All families, businesses and state services rely on road freight to sustain themselves. Trucks move 14 billion tonnes of goods per year. They deliver some 72% of all land-based freight in Europe, or 90% of the total value of goods, while accounting for 5% of total CO\textsubscript{2} emissions. The performance of road freight transport, measured in billion tonne-kilometres, has increased by as much as 20% between 2000 and 2016.

ACEA Oct'18

Europe’s road freight sector

70+% of all goods movements are by road.

EU Emissions:
- 15% from light-duty vehicles (cars and vans)
- 6% from Heavy-duty vehicles (trucks and buses)

New EU vehicle efficiency rules and targets will help, but not if trucks are running empty!

https://ec.europa.eu/clima/policies/transport/vehicles/heavy_en

How many of Europe’s 540,000 SME transport operators have been subject Art.8 audits?

How many have benefited from EEOS (Art.7)?
Sustainable consumption?
Goods volumes set to treble to 2050?

Black Friday - Venice 2018

Quick wins in freight
Prof Alan McKinnon – LEARN Project 6-7th February 2019
What will EU freight solutions look like?

Double length / ‘duo’ trailer, tightly packed delivering once daily to your local shop or parcel motel?

Or energy intensive drones delivering to your door

How will you know your freight policy is working?

- Policy change; relaxing truck size & weight limits
- Grant or tax breaks for new more efficient trucks
- Behavioural changes in ecodriving and collaboration
Freight and logistics: the orphan of sustainability

- Freight and logistics delivers goods to millions of customers around the world
- Freight demand is expected to triple by 2050
- The sector accounts for 8% of global greenhouse gas emissions today and growing
- Freight is a major contributor to air pollution, noise and congestion
- We cannot meet our climate and sustainability goals without efforts in this sector
Freight and logistics is not high enough on the sustainability agenda of government and business

- Global brands often don’t feel ownership of an outsourced service
- Sector is considered complex and fragmented involving too many suppliers
- Difficult to translate high-level goals to practical implementation
- Lack of harmonized approaches and policies
- Limited awareness, knowledge, capacity and funding
- Priorities for sustainability is given to passenger transportation
- Efforts and initiatives are scattered and lack coordination
- Consumers don’t care

Yet, solutions already exist for many stakeholders, sectors, countries

- These solutions combined can reduce emissions by >80% by 2050

Smart Freight Centre. Solutions based on Alan McKinnon ‘Decarbonizing Logistics’ 2018
The key to emission reduction lies with business and collaboration across stakeholder groups

The World of Smart Freight

Businesses can’t see the wood for the trees in initiatives… and the sector is fragmented
**Smart Freight Centre**

- Global NGO dedicated to freight: bring together and work with the global logistics community towards an efficient and zero-emissions global freight and logistics sector
- Our goal: 100+ multinationals reduce at least 30% of logistics emissions by 2030 compared to 2015 across their global logistics supply chains and decarbonize by 2050.
- Society benefits: greater contribution from the logistics sector to Paris Climate Agreement and SDGs

**How we work: provide guidelines and approaches for industry to calculate, report and reduce emissions**

- Calculating & reporting emissions ("GLEC Framework")
- Setting emission reduction targets
- Buying freight services
- Managing truck fleets

© Smart Freight Centre 2019
The LEARN Project (2016-2019)  
www.learnproject.net

Mobilize businesses to reduce their carbon footprint across their global logistics supply chains through improved emissions calculation and reporting

Calculate → Report → Take decisions → Optimize efficiency & minimize emissions

Four “Asks” and LEARN outputs to help

1. Guide for GHG accounting at logistics sites as part of GLEC Framework
2. Calculation tools info sheets
3. GLEC Framework challenge cases & company examples
4. Training course on emissions accounting
5. GLEC Declaration for external reporting
6. Research Agenda
7. Policy Recommendations & input into ISO standard development
8. Growing LEARN network & annual workshop to continue

This project has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 723984.
**Policy recommendations to promote logistics emissions accounting and use of results**

**Methodology development**
- Back GLEC Framework and support ISO development & EN16258 update
- Back single global set of fuel emission factors, including alternative fuels
- Support awareness and information campaigns for industry

**Data collection and exchange**
- Back IMO/IATA protocols & alignment
- Support development of global (or EU) data exchange protocol(s)
- Explore development of neutral platform & IT architecture with TMS link
- Take more central role in data exchange

**Assurance**
- Give companies incentives to collect high quality data and obtain assurance
- Explore assurance needs in case of mandatory report or carbon pricing
- Support standardized assurance guidance and reporting template

**Use of results**
- Establish national Green Freight Program
- Make gov’t targets relevant to the sector
- Support industry surveys & recognition
- Include in NDCs/nat’l/city plans: infrastructure, vehicles/vessels and their operation

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**Global Logistics Emissions Council**

An industry-led collaboration to establish and implement harmonized, transparent frameworks for calculating, reporting and reducing logistics emissions.

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This project has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 723984.
Recommendation to government: Back GLEC Framework and support ISO development & EN16258 update

GLEC Framework: the universal method to calculate emissions consistently across the global logistics supply chain

Picking the right KPI for freight transport energy efficiency

L/100km is a good starting point, but a weak indicator of overall freight efficiency:

- Doesn’t include load factor which is a key element of freight efficiency programs
- Doesn’t differentiate between loaded and empty km
  - In fact empty km give you a better L/100km figure!
- Doesn’t tell you if you have efficient routing or not.

However L/100km can help to gather the data needed to support Litre per Tonne.km
Integrating into harmonized data collection protocols

Steps towards common data collection architecture:

▪ Agree on common KPI: fuel consumption (and emissions) per tonne-km as per GLEC Framework & international freight statistics
▪ Develop data collection and interoperability standards
▪ API development
▪ Mutual recognition of national data platforms (for international operations)

▪ Integrated energy efficiency & freight transport GHG reporting
▪ Supported by a consistent approach to reporting across countries when implementing EED, Article 7
  ▪ Start with L/100km progress to L/Tonne.km
Summary

What are your EnMS actions from today?

- **Reduce car use = reduce congestion for goods & public transport**
- **Review freight operations / supply chain**
- **Use Art.7 to incentivise Green Freight programmes**
- **Start with the basics**
  - **Educate** Avoid Shift Improve
  - **Smart Freight** offers GLEC to show savings
  - **ECOdrive** train professional drivers
Thank you!

Show of hands, how many . .

Want to meet again on transport?

A  Will work from home more often?

S  Consider alternate modes?

I  Slow down on the way home?

www.aems.ie
+353 1 230 5018
conor@aems.ie
@conormolloy

Next Smart Transport Manager Training STMT end June Dublin