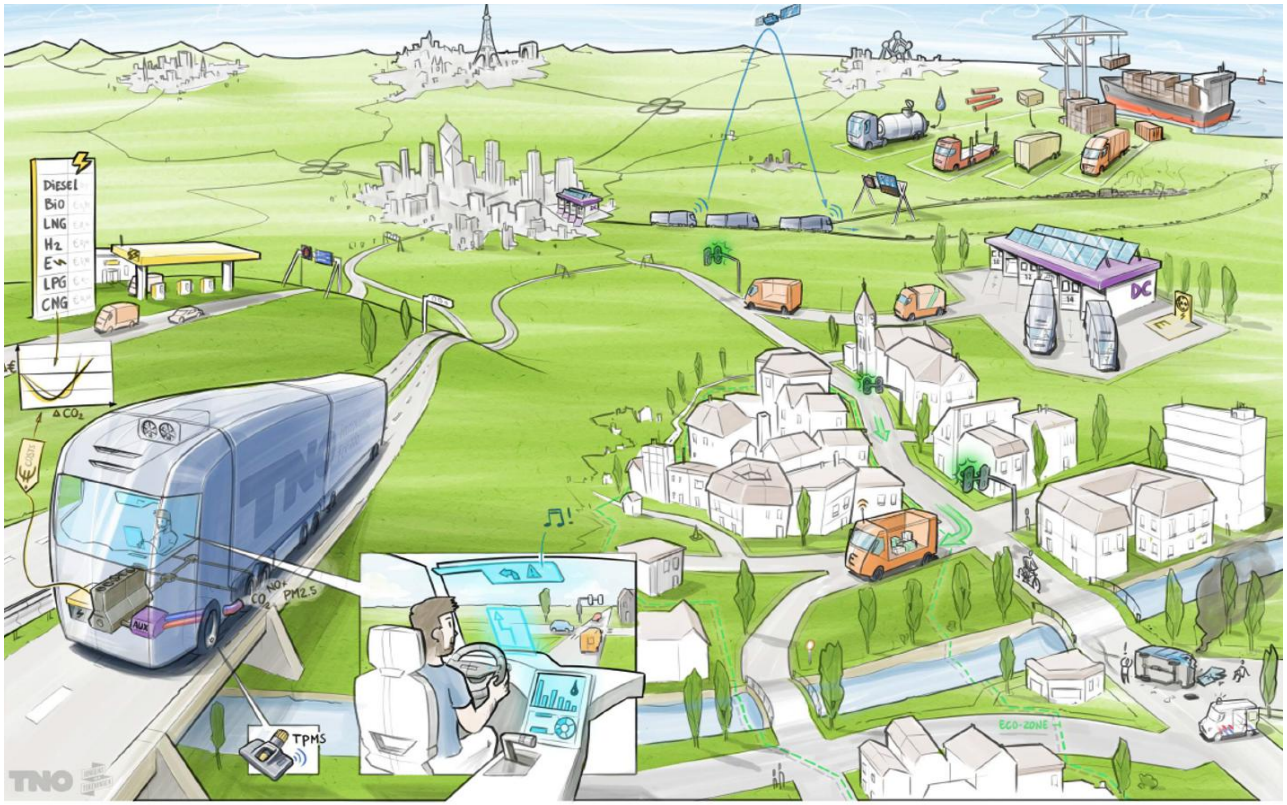
STATE OF THE ART IN CARBON FOOTPRINTING OF LOGISTICS ACTIVITIES

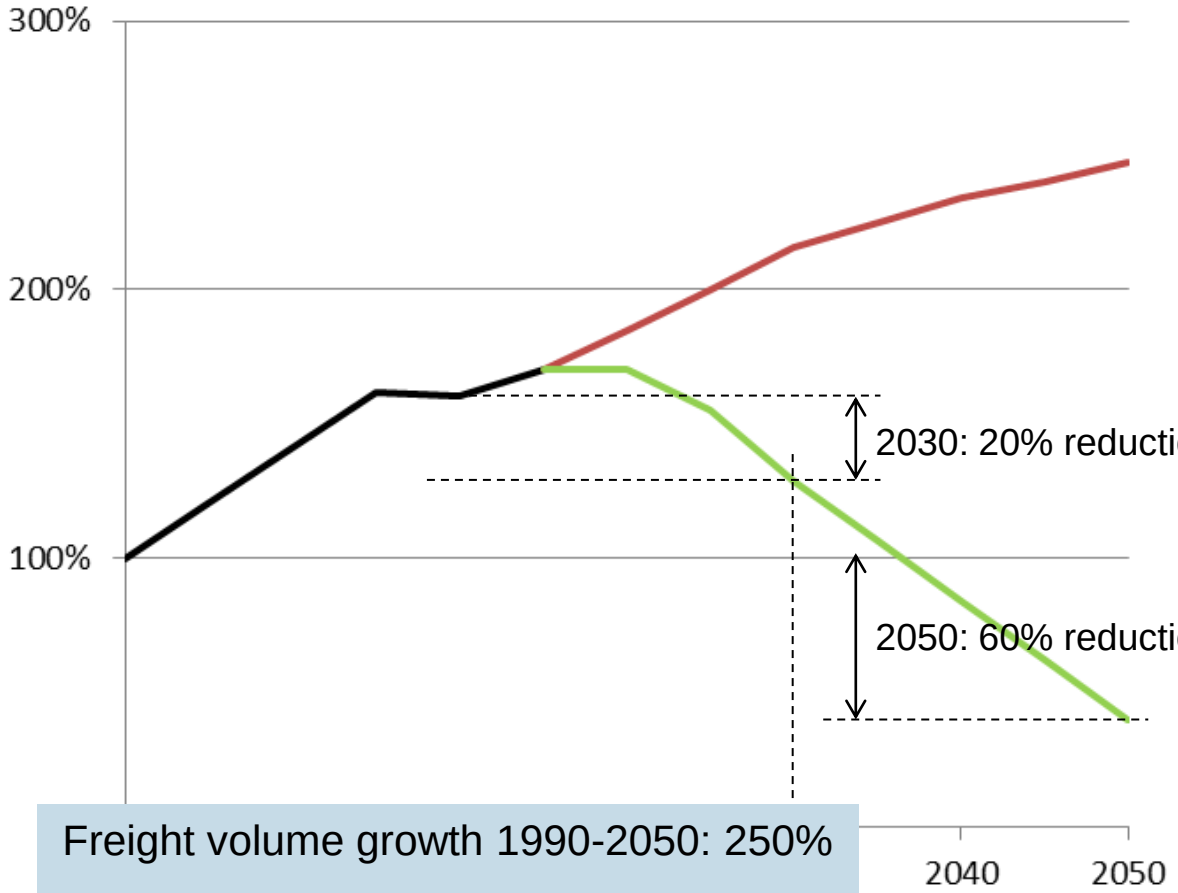


Igor Davydenko

TNO STL, Den Haag NL

Reduction goal Paris: Freight transport

CO_2-emissions freight transport in EU



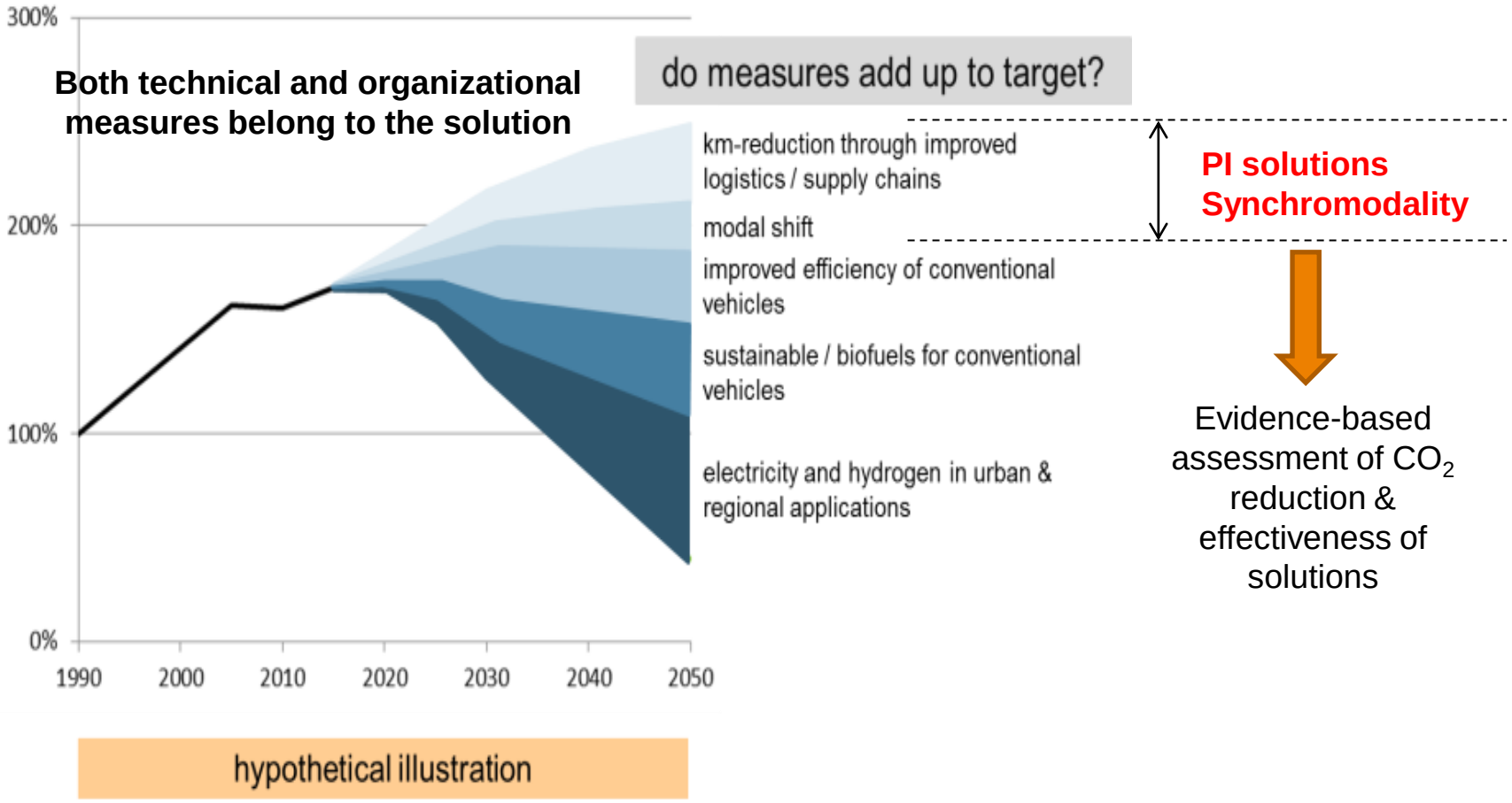
Freight volume growth 1990-2050: 250%

Reduction of absolute emissions: 60%
➔Per ton-kilometre transported:
FACTOR 6!

Trends to 2050",

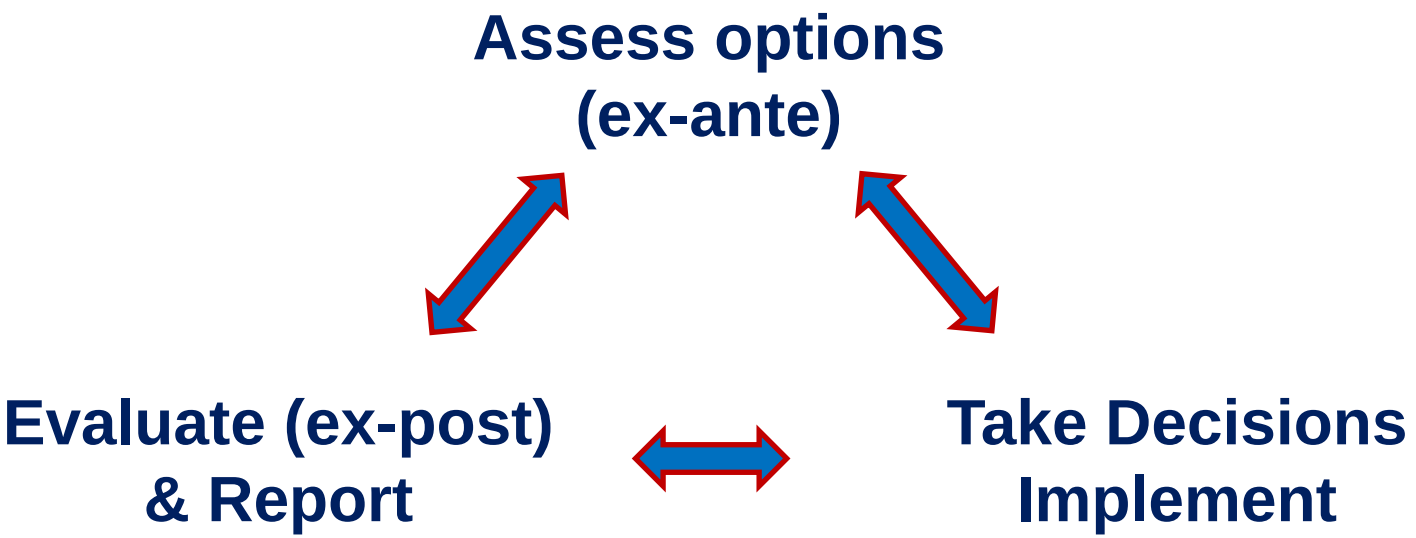
Note: Reduction goals freight transport assumed equal to overall reduction goal for transport sector in EU Whitepaper (2011)

LOW-CARBON "BUILDING BLOCKS"



CARBON FOOTPRINTING IS A TOOL FOR EMISSION REDUCTIONS

- **Carbon footprint** is the total set of greenhouse gas emissions caused by an individual, event, organisation, or product, expressed as carbon dioxide equivalent



CARBON FOOTPRINT OF COMPLEX LOGISTICS CHAINS

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absolute GHG emissions ⟺ relatieve emissions per activity unit

E_i = CO_2 emissions allocated to shipment by carrier i

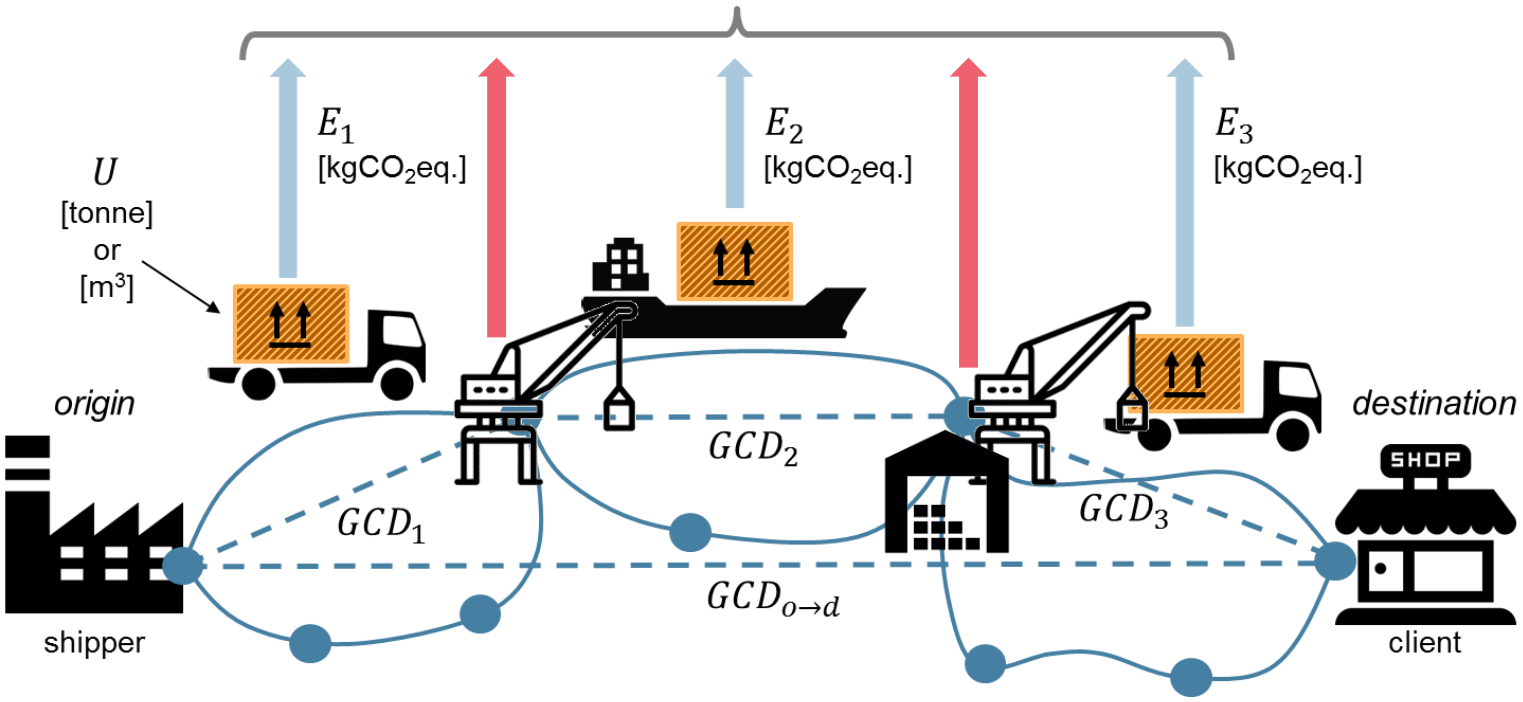
$$E_{shipper} = \sum_{i=1}^{n} E_i$$

$$KPI_{supply\ chain} = \frac{\sum E_i}{U}$$

[$kgCO_2eq.$ /ton] or [$kgCO_2eq.$ /m^3]

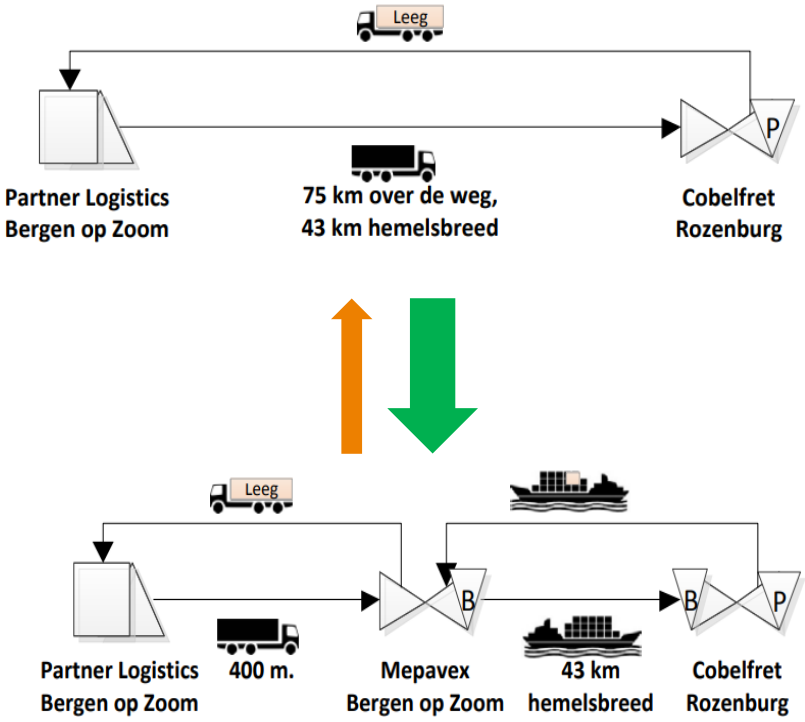
$$KPI_{logistics\ chain} = \frac{\sum E_i}{U \times GCD_{o \to d}}$$

[$kgCO_2eq.$ /ton.km] or [$kgCO_2eq.$ /m^3.km]



SYNCHROMODAL TRANSPORT:

EVIDENCE FOR THE CO2 REDUCTION EFFECT



CO2 per ton shipped

▼CO2 % saved

CO2 per ton shipped

STATE OF THE ART

- **Carbon footprinting is mostly driven by the users of transport; LSPs support this**
  - Specific goals for reduction of carbon footprint from logistics activities
  - Logistics network optimization
  - For carriers it is a way to stand out from competition

- **Reliance on default emission factors is the first step**
  - Good for quick evaluation of the options
  - Works well for ‘average operations’
  - Challenging for fine tuning of the logistics solutions and non-standard shipments

- **Necessary data are here, processing real world data is still a challenge**
  - Freight consolidation requires determining a shipment’s share
  - Carriers generally have data on fuel use, while shippers have shipment data

- **Substantial interest in application of methodologies**
  - What drives CO2 emissions?
  - How reliable are the computation results?
  - What is the fairest way of emission allocation?

Practice Examples

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LEARN
Logistics Emissions Accounting & Reduction Network

SMART FREIGHT CENTRE

TKI DINALOG
Dutch Institute for Advanced Logistics

Bubble Post
smart warehousing & city delivery

SMART PORT

DHL

GLEC
GLOBAL LOGISTICS EMISSIONS COUNCIL
LED BY SMART FREIGHT CENTRE

FRET
Carbon Footprint of Freight Transport

Port of Rotterdam

postnl

GEMEENTE TILBURG

Connekt
Lean & Green

prominent

Gemeente Amsterdam

LEAN & GREEN

PETER APPEL
Transport

Gemeente Utrecht

TransMission

simacan

NEXT STEPS

- **Standardization**
  - We strongly need a commonly accepted method on emission computation and accountancy
  - ISO standard is the most preferred outcome

- **Rolling out tests, cases and implementations**
  - Helping organizations with carbon accountancy
  - Getting more critical mass
  - Getting businesses used to
    - Carbon footprinting
    - Support decisions evidenced by CF

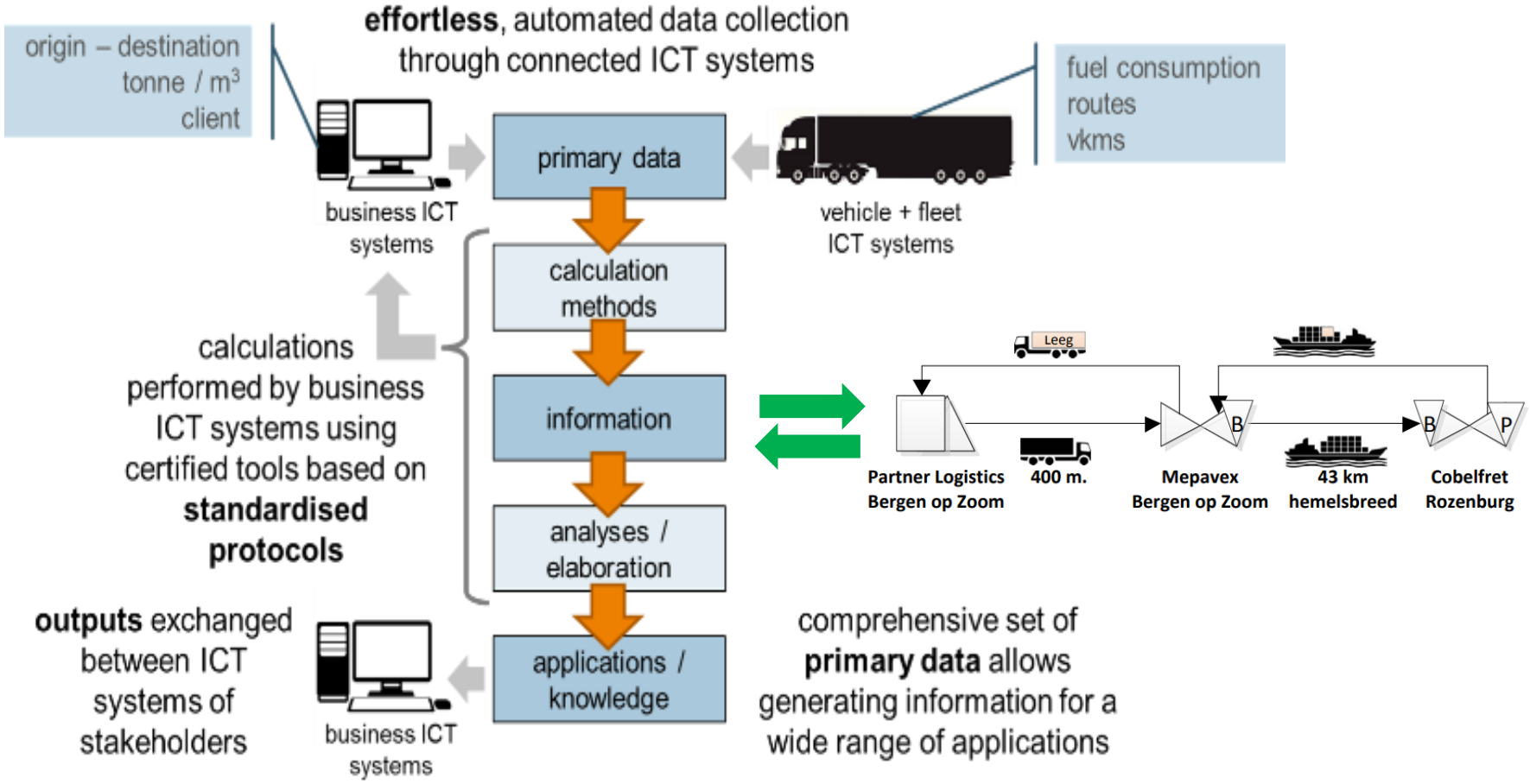
NEXT STEPS: ICT

Developments towards logistic data travelling along with shipments can also be used to collect data for carbon footprinting

Getting IT systems ready for automation

- Solution for emission data exchange
- Provide sufficient protection of sensitive performance data
- Allow for a right level of aggregation
- Internalization of the results: help taking decisions on low-carbon logistics solutions

OUTLOOK: AUTOMATED SOLUTIONS



CARBON FOOTPRINTING OF LOGISTICS ACTIVITIES

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