

P&G

alice

Alliance for
Logistics Innovation
through Collaboration
in Europe

Designing a Sustainable Supply Network & The Physical Internet

Sergio Barbarino

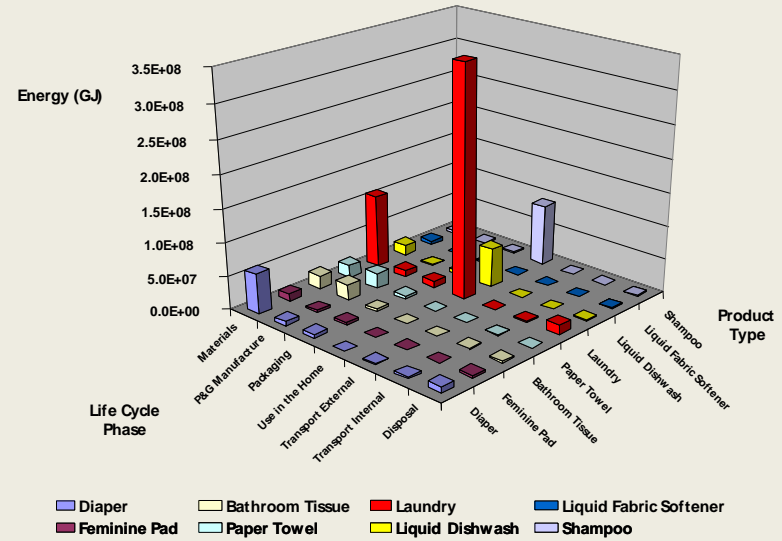
Research Fellow P&G



Lifecycle thinking

- Large improvements in some lifecycle stages may be negligible compared to small improvements or negatives in others

Company Product Energy Usage from Life Cycle Perspective –
Lead to Tide Cold Water Innovation

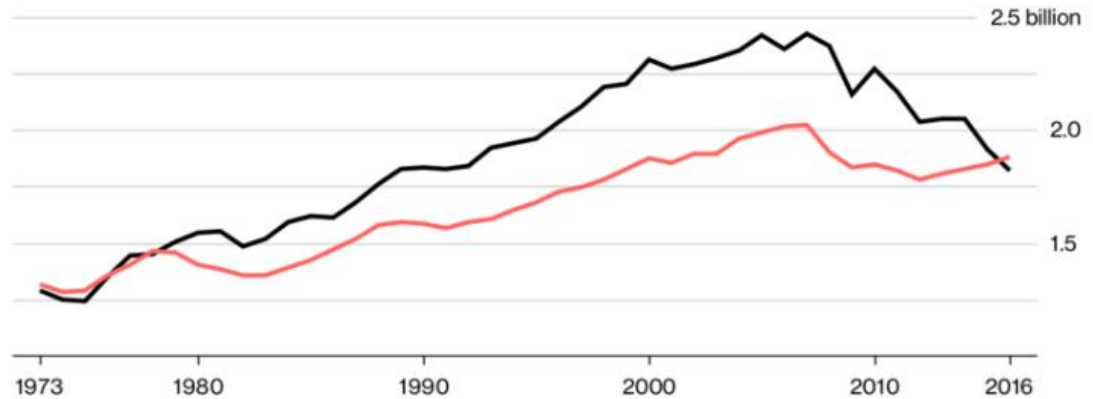


Transportation
Becomes The
Biggest CO2 In
The United
States

America's New Pollution King

Transportation emissions have surpassed electricity emissions for the first time since 1978

■ Electricity emissions (metric tons of CO2) ■ Transportation emissions



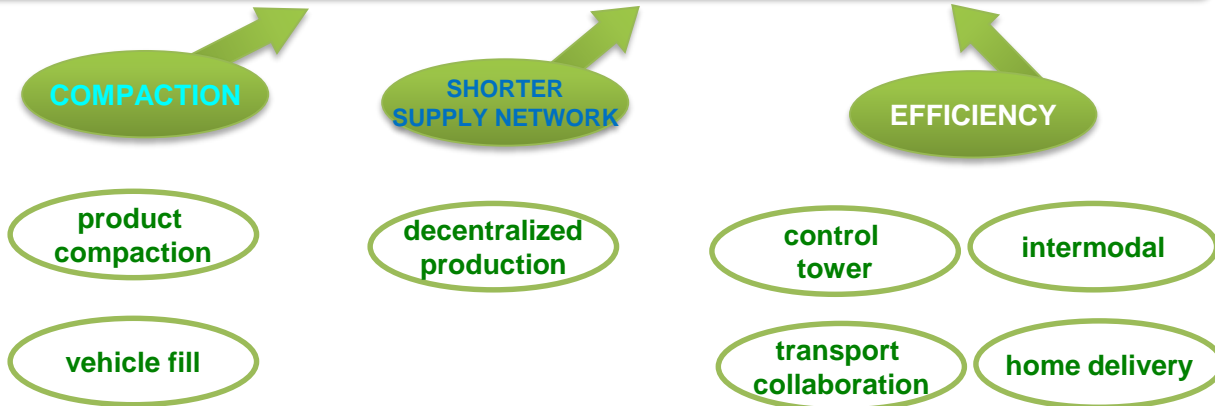
U.S. Energy Information Administration

Bloomberg

Sustainability -> Innovation in Supply Chains



Transport burden = **Volume shipped** X **KM travelled** X "Cost" of 1 Km





Compaction

Less everything
but performance



1988: Pioneered compaction with
Today's dosage 74% less per load



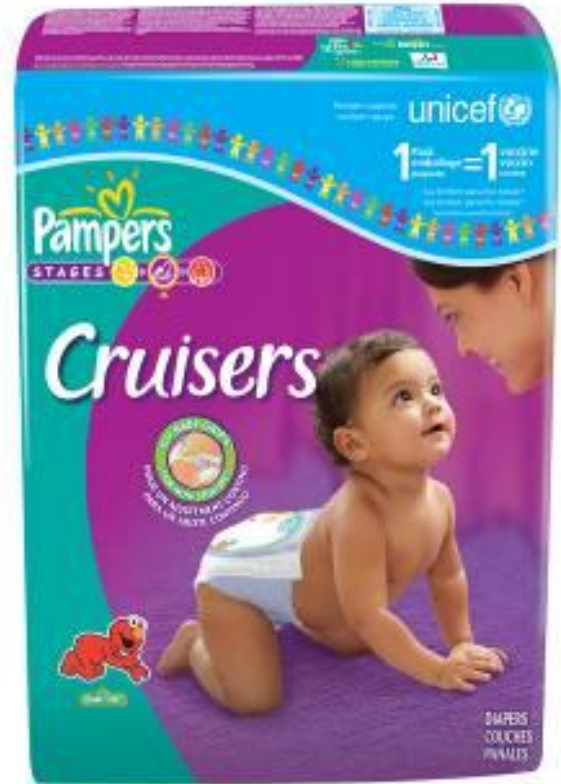
2007: 2X compacted Tide liquid in NA
40% less water, 40% less plastic



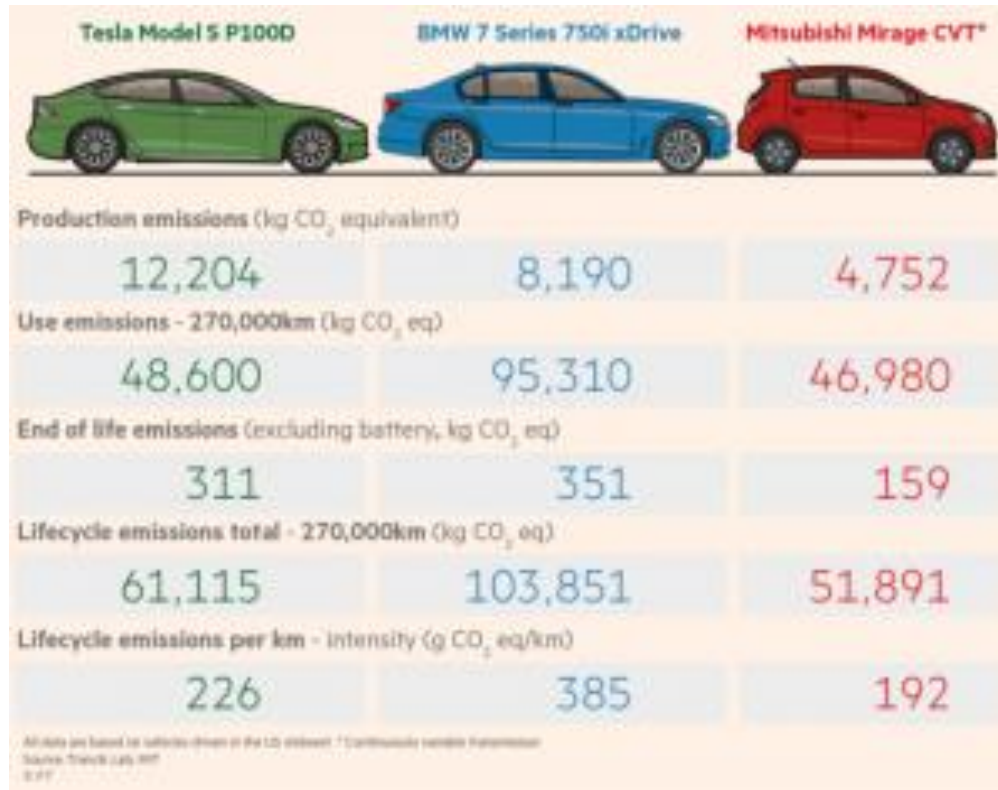
2013: Tide Pods
Most compacted detergent ever

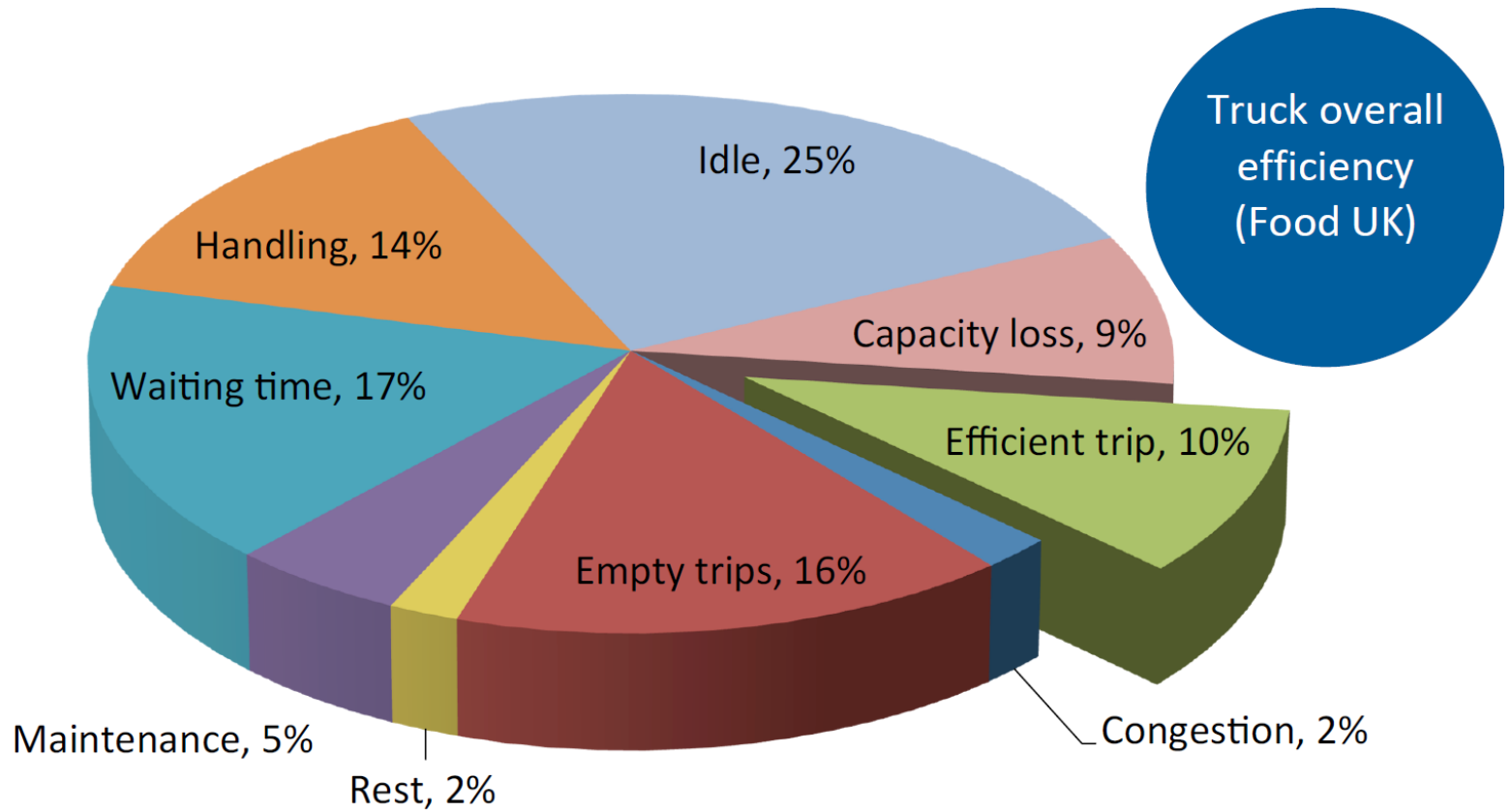
Sustainable Supply Network Design

- Just in Time...
- How to apply it correctly?



Electric Cars...or Small ones?





Conserving Resources: Distribution Optimizing Outbound Transportation

Our strategies for fewer and friendlier miles:

- Flow management
- Operational excellence by optimizing our distribution networks and vehicle fill
- Shifting to intermodal transportation
- Collaboration

2020 Goal:

20%

Reduction km/unit
of volume



Cube Fill

Optimising Light & Heavy Goods Mix



**Light Goods: Only 25%
of weight limit**



**Heavy Goods: Only
40% of volume limit**

This is bad for
both
profitability and
environment



**Mixed Goods: Target
80% weight & volume
limit**



+



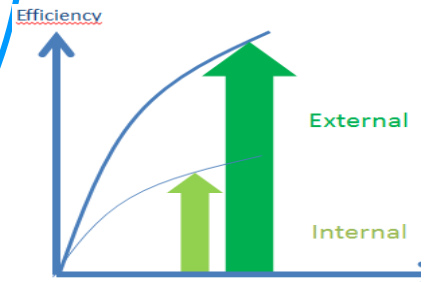
“Cube-Fill” Concept



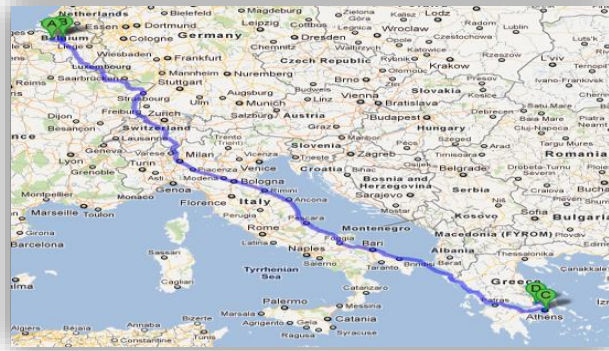
Container Limit = 87m³ & 24 tonnes
Overall efficiency = 80% weight & 80% volume



TRANSPORT COLLABORATION



TUPPERWARE VEHICLE 'FILL' COLLABORATION



>15% less Cost



Save > 2M Tons CO₂



Vehicle Cube Fill improvement

55% → 85%

by heavy & light mixing

Optimize Warehouse

Productivity



Show Industry Leadership



Supply Chain Award
winner
Prize of the Audience 2013

Transformers Demonstrator test results

Hybrid-on-Demand:

3 to 5%



Aerodynamic features:

approx. 8%



Loading efficiency:

Up to 40%



Motorway: 2 to 4% fuel consumption (FC) reduction
Urban heavy traffic: 6 to 7%

90 km/h constant speed:
Up to 14% drag reduction,
Up to approx. 8% FC reduction

1 additional pallet on floor (3%);
Double floor: additional floor space;
+10 pallets = +30% = +16 minutes



SYNCHROMODALITY

FROM A ONE LEAD TIME MODEL WITH PLANT STOCK

CURRENT SUPPLY CHAIN SET-UP			
PRODUCTION	PERIOD N	PERIOD N+1	PERIOD N+2
PLANT INVENTORY			
FAST AND AGILE TRANSPORTATION MODE			

TO A MULTIPLE LEADTIME MODEL WITH PIPELINE STOCK

SYNCHROMODAL SUPPLY CHAIN SET-UP			
TIME	PERIOD N	PERIOD N+1	PERIOD N+2
PLANT INVENTORY			
FAST AND AGILE TRANSPORTATION MODE			
FAST AND STABLE TRANSPORTATION MODE			
SLOW AND STABLE TRANSPORTATION MODE			

An inconvenient Truth

- A consumer shopping by car (5km from home) adds to the Product 50% of the CO₂ footprint of the transport supply chain till the supermarket shelf....

-Can we fix that?

Conventional shopping trip: g/CO₂ per consumer trip/activity

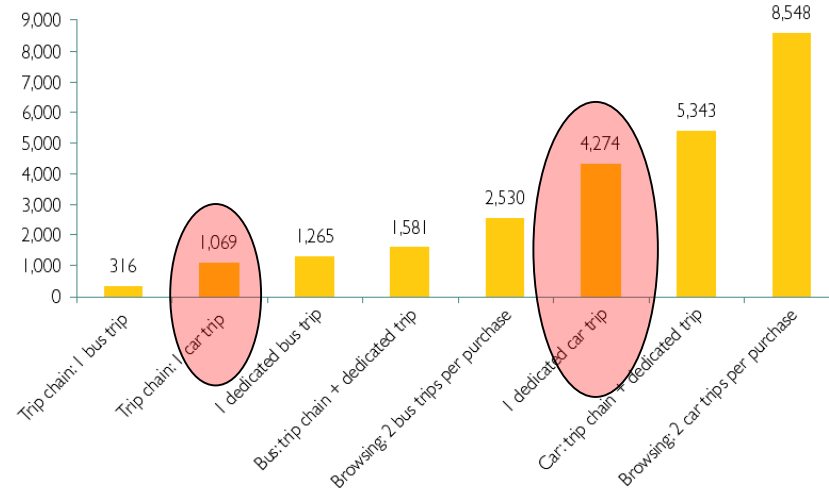


Figure 1

Source: EDWARDS AND MCKINNON, Shopping trip or home delivery: which has the smaller carbon footprint? Logistics Research Centre, Heriot-Watt University.

Direct to Consumer Delivery

Home delivery: g/CO₂ per drop/activity: assumes personal travel is undertaken by car

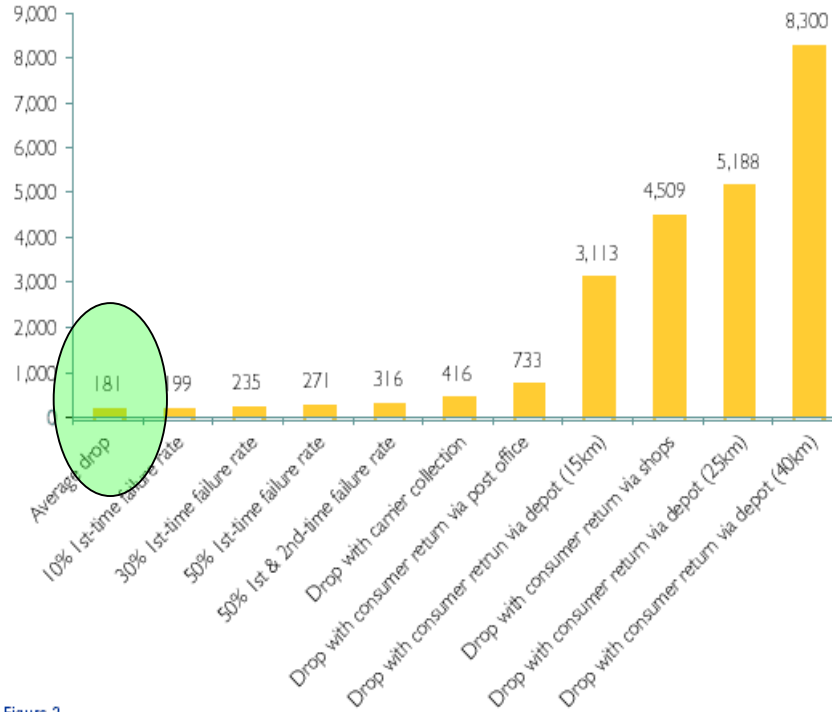


Figure 2

