

LCA international perspective

How the **UK automotive supply chain**
could demonstrate **international leadership**
and an **economic advantage**
by embracing **life cycle assessment**
as the world moves towards **net zero emissions**

LCA international perspective

UK automotive supply chain

international leadership

economic advantage

life cycle assessment

net zero emissions

1

The Carbon Trust



About the Carbon Trust

Mission driven: to accelerate the move to a sustainable, low carbon economy



12 years –
Director of
Footprinting
Carbon Trust

Almost 20
years
automotive
industry
Ford/Visteon

M.Eng.
Manufacturing
Engineering
and
Management
*Loughborough
University*

All business sectors; governments; investors

International leadership

Economic advantage

Life cycle assessment

Net zero emissions

Independent, trusted, rigorous, not for profit

Breadth of service

ADVICE

Business Advice

Helping businesses capture the opportunities in a sustainable low carbon world

Government Advice

Providing cutting-edge policy advice and insights on the transformation of markets

Public Sector Advice

Enabling the public sector to cut costs and emissions

FOOTPRINTING

Measuring

Understanding the environmental impact of an organisation, product or service

Certifying

Providing independent verification of organisational or product footprints to endorse sustainable leadership



TECHNOLOGY

Implementation and Finance

Providing expertise and support to businesses to put energy efficiency plans into action



ACCREDITED
SUPPLIER

Innovation

Partnering with companies and governments seeking to create value from the clean technology revolution



Depth of experience

We have worked with:

75%

FTSE 100 companies

70%

Local Authorities

90%

Higher Education
Institutions

50%

NHS Trusts

and undertaken:

35,000

on-site surveys

1,000

organisation footprint certifications

50,000

advice line calls per annum

to deliver:

£1.6bn

spend on energy
efficient equipment

£4.5bn

energy waste avoided

Retail & FMCG



Healthcare & Pharma



Manufacturing



Telecoms & Media



Financial Services



Industrials



Hospitality & Leisure



Transport & Logistics



Food & Drink



2

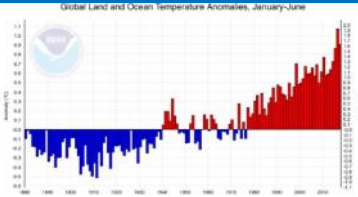
**What's changing in the world, from
which advantage can be found (or lost)**

Recent Changes In the World

ACTIVISTS/AWARENESS



CLEAR WARMING EVIDENCE



EXTREME WEATHER EVENTS



PARIS 2015

PARIS AGREEMENT



CONSUMERS

LARGE COMPANIES



SCIENCE BASED TARGETS

Reduce own and Value Chain emissions consistent with 1.5 degree rise only

SUPPLY CHAIN COMPANIES

INVESTORS

TCFD

GOVERNMENTS

???

Why do companies undertake LCA?

Life cycle assessment

Economic advantage

Future of your business

- Major transition in how products are delivered
- Ideally within environmental limits – 2 key limits: GHG, water
- Model the potential impact – companies and investors
- Invest in products which have a sustainable future
- Part of supply chains compatible with limits which meet customer needs
- Final product
- Interim product
- Not just ‘footprint’ but financial and supply risk
- Remember investors are waking up to this

To sell more to business customers

You have products which enable your customers to manufacture products that are part of the future – may need different products over time in different countries/sectors during transition.

To influence investors

Prove you are part of the future. Continually adapting your business. You know what is needed longer term - no stranded assets. Which supports your share price, and access to cheaper money.

To reduce risks

You understand risks from climate change from market changes, legislation, taxation, supply issues. You have plans to mitigate in short and long term before significant impact.

To reduce costs

You are identifying actions which simultaneously improve sustainability and reduce costs across the supply chain and own operations. You have processes to replicate pilot initiatives widely across the business to maximise impact.

To influence NGOs

You are staying ‘ahead of the game’ in terms of mitigating potentially very big negative impacts from NGOs attacking your sustainable credentials, which may spread rapidly via social media.

To influence consumers

Retail/consumer ‘green’ product selection not so big yet... but growing – stay on the front foot as keeps rising, to not be overtaken by competitors.

3

Multi-criteria or GHG Emissions?

What criteria do I footprint in my LCA approach?

What will I do with results of 15 categories?

- Climate Change
- Ozone Depletion
- Ecotoxicity for aquatic fresh water
- Human Toxicity - cancer effects
- Human Toxicity – non-cancer effects
- Particulate Matter/Respiratory Inorganics
- Ionising Radiation – human health effects
- Photochemical Ozone Formation
- Acidification
- Eutrophication – terrestrial
- Eutrophication – aquatic
- Resource Depletion – water
- Resource Depletion – mineral, fossil
- Land Transformation

Economic advantage

To sell more to business customers

To influence investors

To reduce risks

To reduce costs

To influence NGOs

To influence consumers



TCFD



RE 100 EV 100

What is the implication of trying to footprint more categories?

Extra cost
Reduced specificity and granularity

Only calculate what will be used for valuable decision-making

Pragmatic solution often:
GHG + optional water + others only when important

Gives by far the best “Cost v Value”

Concentrate on GHG emissions plus others where important, with standardised approach, can cascade data through supply chain levels to drive optimisation

Beware trade-offs
DIESEL => PETROL ENGINES,
CHOICES IN BATTERY MATERIALS,
HIGH VOLUME USE OF SCARCE MATERIALS IN ELECTRONICS

4

**How standardised is carbon footprinting
(GHG accounting) internationally?**



How standardised is carbon footprinting internationally?

In the beginning... Life Cycle Assessment

Has been around for many decades
ISO14040 series

Complex, academia, some large companies

Still the basis for footprinting


Had to be simpler to be used widely...

PAS 2050, and Carbon Reduction Label

2007 Carbon Trust and DEFRA create
PAS2050

Easier process, only carbon – becomes possible for many companies

and launch the Carbon Reduction Label




GHG - 3 very similar standards

There are now 3 widely used standards – Carbon Trust sat on all 3 committees...

Updated PAS2050

Greenhouse Protocol Product Standard

ISO TS14067

...to ensure that for measurement, all 3 are methodologically almost identical

Ensuring comparability

Some variance in interpretation of rules/guidance.

Ideally scheme rules and either product category rules, or library of detailed rules.

Easy to define as a company what you expect from suppliers sending data.... e.g. for recycling use EU-PEF.

Assisted in the creation of new schemes

As well as running our scheme, transfer our know-how, to other labelling schemes



Water

Not so standardised

Some big differences in terminology

Big differences in boundaries

1kgCO₂ anyway has same impact – to be meaningful water must be viewed locally

5

**Transition Risks in the journey towards Net Zero –
business customers / consumers / investors / governments**

What is Net Zero?

A net zero company

Sets and pursues an ambitious 1.5°C aligned science-based target for its full value-chain emissions.

Remaining hard-to-decarbonise emissions can be compensated using certified greenhouse gas removals.

Greenhouse Gas removals

Compensation of emissions is restricted to certified removal of greenhouse gasses from the atmosphere.

Removals should be permanently sequestered (or at least for 100 years – open to debate)

Example Greenhouse Gas removals

GGR options including large-scale forestation, biochar, BECCS (bioenergy with carbon capture and storage), DACCS (direct air capture and carbon storage), (Geological Biogenic Storage)

Achieving net zero

If all companies achieve the above the world stops net emitting GHGs from human activities

So what is carbon neutrality compared to net zero?

Carbon neutrality to PAS2060 allows for a wider range of offsets, including energy efficiency or avoided deforestation

Useful short-term – doesn't get the world to net zero

What are businesses doing to move towards Net Zero – Transition risks

External drivers

In “Why companies footprint” we saw:

- The key drivers of Paris Agreement, and investors waking up to sustainability.
- The need for companies to demonstrate they have a Sustainable Future.
- Pathways towards Net Zero



Science Based Targets

Science based targets define the rate at which each company needs to reduce emissions to ensure that when these are added together the world remains on a pathway of well-below 2 or 1.5 degrees.

Own company and value chain.



Taskforce for Climate-related Financial Disclosures

Established by G20 Financial Stability Board to increase disclosure of climate change impacts within businesses and financial plans.

Quantifying physical risks and transition risks (taxes, technology, markets) impact the business. Plus resilient strategies to ‘weather these’ impacts.



Value Chain Reductions

Leading companies making ambitious commitments to reduce emissions and increase transparency across their value chain.

Suppliers

Operations

Customers

Main impacts lie beyond their four walls for most companies.

Reduction Roadmaps

Measure the current state

Analyse what is possible/probable

Set targets (cascaded)

Create and implement reduction roadmap

Suppliers

Operations

Customers

Reputation

Many companies driven into footprint by desire to improve (or retain high) CDP scores.

Increasingly companies want to show compliance with other ‘labels’, to demonstrate action.

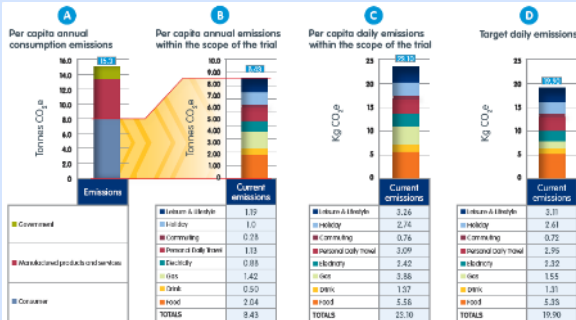
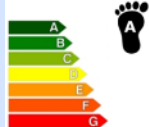


Scenarios

Other entities doing to move towards Net Zero – Transition risks

Consumers

Activists
Climate emergency
Vegans
Carbon Allowance
Tan Pu Hui



Governments

Paris agreement
Net Zero
Scenario planning
Taxation
Legislation



Investors

Established by G20 Financial Stability Board to increase disclosure of climate change impacts within businesses and financial plans.

Quantifying physical risks and transition risks (taxes, technology, markets) impact the business. Plus resilient strategies to 'weather these' impacts.



Changing how companies are valued by their performance in this area.

i.e. pricing in transition risk into share price

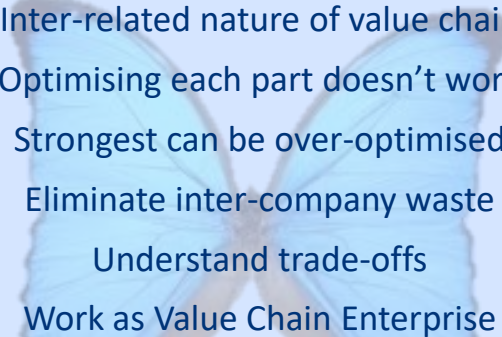
6

Value Chain Optimisation / LCA and Lean

Working as a Value Chain Enterprise



The Butterfly Effect



Inter-related nature of value chain
Optimising each part doesn't work
Strongest can be over-optimised
Eliminate inter-company waste
Understand trade-offs
Work as Value Chain Enterprise

Value Chain Enterprise

Work together to:

- Optimally fulfil end-customer needs.
- Single "value chain enterprise"

Value chain holistic decisions:

- Resources, energy

Incentivise people to optimise whole

Trade-off embodied and use

Important trade-off is between
embodied and use

Focus on reducing the total lifetime
impact

Lean and Product Footprinting

Lean and Product Footprinting

Very related.

Don't have 2 teams – integrate.

Focus on energy material and labour.

Don't just try to eliminate waste – may be valuable input into another product – optimise the total.

Making more radical changes

Continuous improvement of processes is vital, but limited.

Re-think how you meet customers needs
What are they buying – mobility or car.

Model current and alternative future states.

Break down misconceptions, by using environmental improvements as a way to adjust 'normal' behaviour.

7

CONCLUSIONS

In conclusion

Net zero emissions

Major transition coming to live within environmental limits – especially commitments to achieve net zero emissions

UK automotive supply chain

Invest in products which will be part of supply chains compatible with these limits, which meet customer needs and expectations

Life cycle assessment

Use LCA to demonstrate this
Focus on common GHG emissions calculations cascaded through tiers, Add other categories if important

Economic advantage

Not just 'footprint' but mitigate transition risks:

To sell more to business customers

To influence investors

To reduce risks

To reduce costs

To influence NGOs

To influence consumers

International leadership

UK seen as leaders in GHG assessments, transition risk assessment, UK Government Net Zero – leverage this with action