

Sustainability and the circular economy

Dr Helen Bailey



About FM Conway

Independent
family-run business

£300m
turnover and 2,800-strong workforce

57 years
of innovation and learning



Strong cross-sector partnerships and self-delivery at the heart of the business

Thoughts on what I might say...

Something about;

Future needs – what are they?

Expectations from the stakeholder – ever stopped to think about this?

Towards a true circular economy – thinking it through

A holistic approach to sustainability and contextualising for the future



Products that fulfil future market needs

The Telegraph

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HOME » NEWS » UK NEWS » ROAD AND RAIL TRANSPORT

What the roads of the future could look like

A new report lays out the innovations we could see on our roads in the future



Infographic on roads of the future Photo: Arup

Definition: a **need** is something that solves a **real or imagined problem**

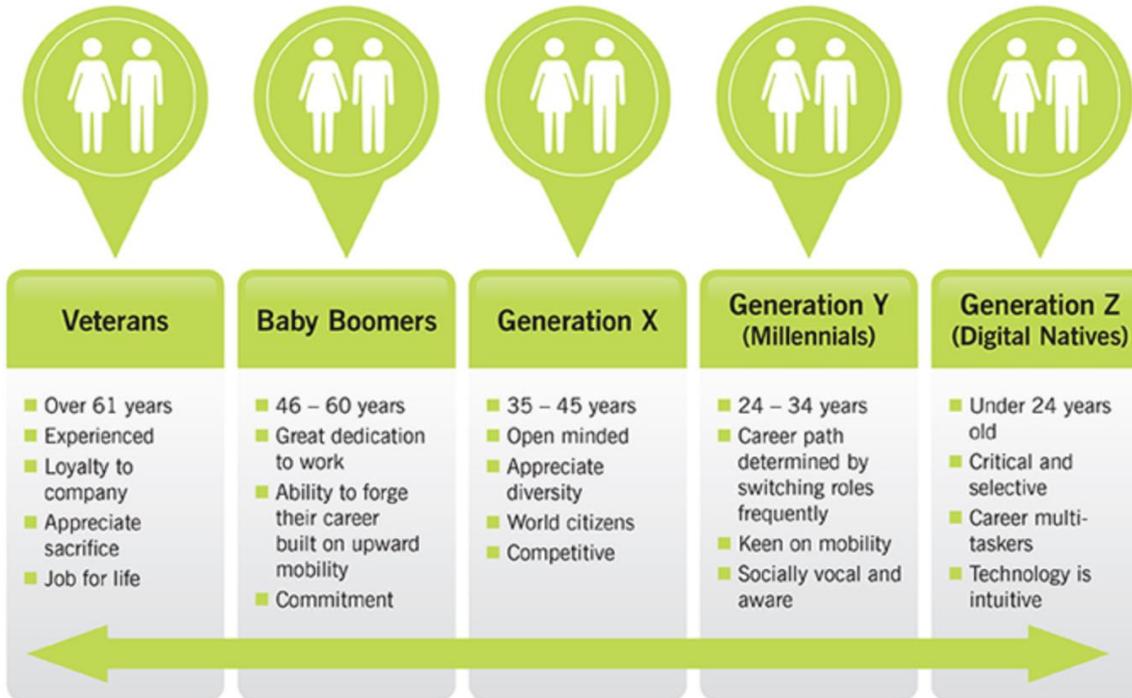
So what does that real or imagined problem look like?

These challenges are not simply met with a shovel and a cheque-book. There are numerous complexities to be confronted as well (KPMG, 2010)

What are the influencing factors and who influences them?

Is it just about needs? Or expectation?

5 Generational Workplace



Stakeholders are expecting;

- More
- Increased value
- Quality over the lifespan (stakeholder lifespan = longer)
- Customer experience
- Convenience (mobility)

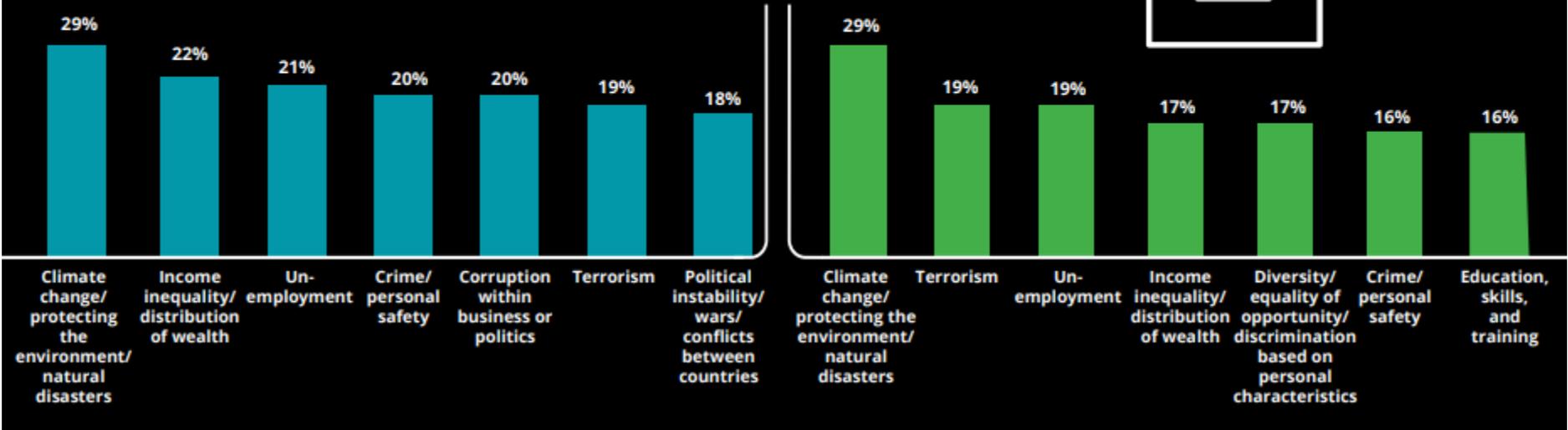
Understanding the demographic

Meet generation Z and the millennials!*

Source: deloitte-2019-millennial-survey.pdf

Climate/environment is both generations' top concern

Percent personally concerned about:



Climate and the environment – top concerns

- Stringent air quality regulations

Since 1972 and the opening of the Stockholm Convention on the Human Environment, World Environment Day (WED) has been **celebrated every 5th of June** as an initiative to stimulate global awareness of environmental issues and encourage action.

- What did our industry do on world environment day?

Going Green: Airlines Roll Out Eco-Friendly Initiatives on World Environment Day

7 June, 2019 in Industry Written by Ari Magnusson



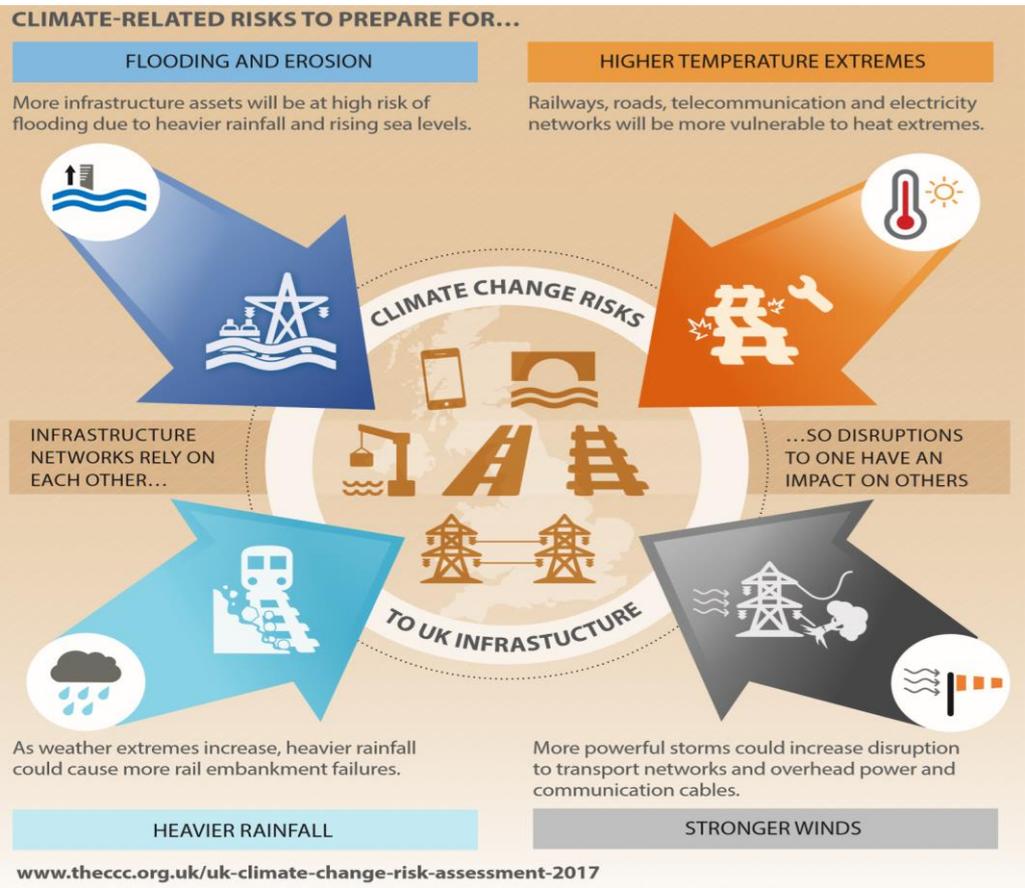
Source: <https://apex.aero/2019/06/07/airlines-rolling-out-eco-friendly-initiatives>

Climate and the environment – top concerns

2030 Agenda for Sustainable Development;



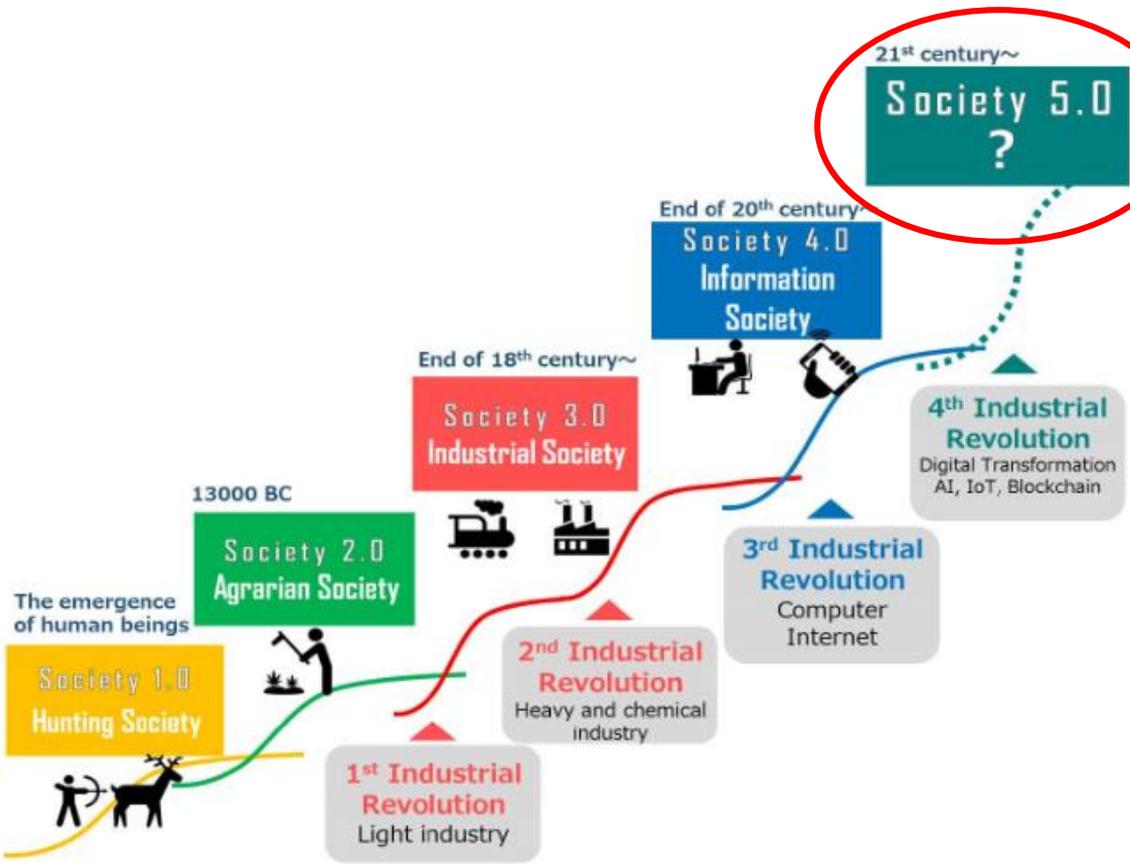
But wait, the climate is changing isn't it?



- A few points to note:
- Climate change is real
 - Impacts all aspects of road transport.
 - Currently, the transport network struggles with extreme weather events
 - These are likely to increase in;
 - Frequency
 - Severity



Meanwhile, the industrial revolution continues

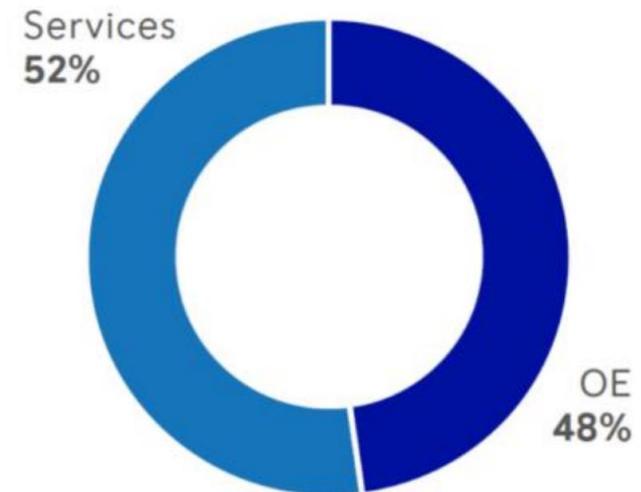


further technological development
changing human process integration

Source: *Keidanren Society 5.0 Co-Creating the Future 2018*

Industry 5.0, what does it mean?

- Customers to customise – personalisation (on mass)
- Collaboration – man and machine (robot)
- Real time data – moving from product to service
- Cleaner, safer and more competitive power
- Digitisation



Source: Rolls-Royce plc Annual Report 2017

Can we satisfy *all* of these demands?



Future market needs, technology we can't resist

As stakeholders, what is it that we need?

Maslow 2.0?



Source: <https://bluesyemre.com/2019/08/19/digital-needs-pyramid-of-maslow-2-0/>



So we have the data, how best to use it?

Use of predictive models to understand the variance of binders and link to field performance

Using the data to refine asset management models and consider product guarantees

Transparency

Positive feedback loops

In real time



Data in action



M2M CCS
Allows driver to see his compaction performance and also the performance of other rollers on the work site

GNSS System
Accurately records position of roller

Accelerometers
Record stiffness of material and number of dynamic passes

Infrared Temperature Sensor
Records rolling temperatures

Is durability the same thing as sustainability?

Dictionary

 **durability**
/dʒʊːrəˈbɪlɪti/

noun
noun: **durability**

the ability to withstand wear, pressure, or damage.
"the reliability and durability of plastics"

Similar: imperishability permanence longevity ability to last lastingness 

 **sustainability**
/səsteɪnəˈbɪlɪti/

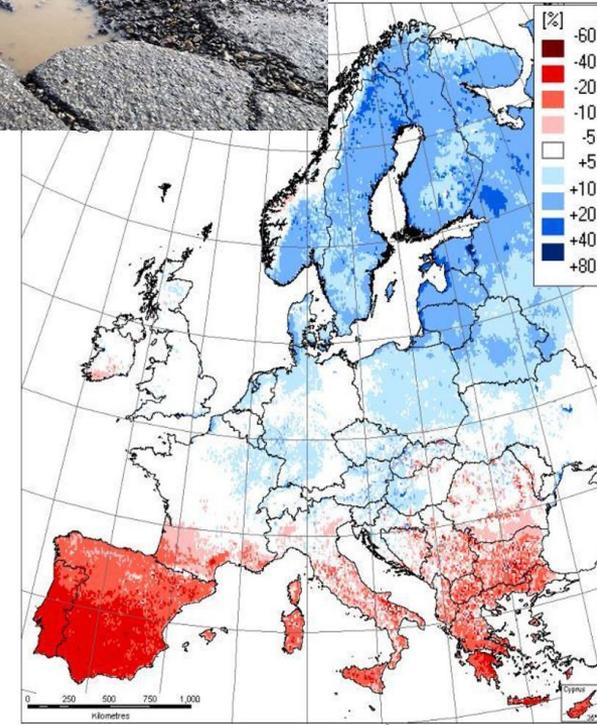
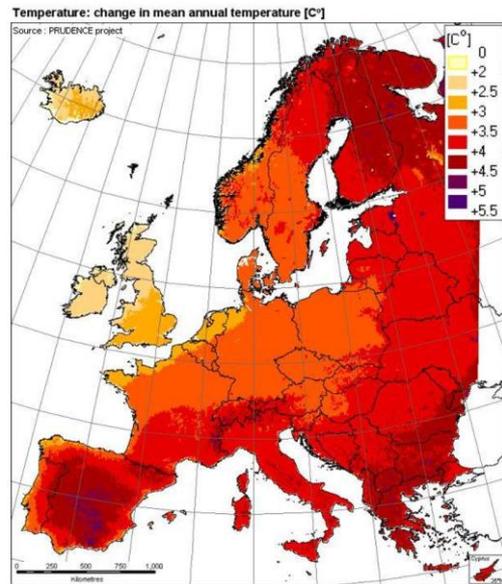
noun

the ability to be maintained at a certain rate or level.
"the sustainability of economic growth"

- avoidance of the depletion of natural resources in order to maintain an ecological balance.
"the pursuit of global environmental sustainability"

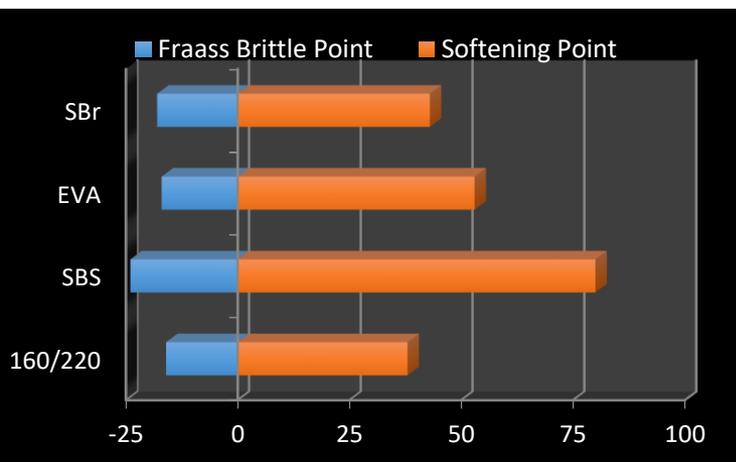


Uncertainty in design?



Improving susceptibility

- Significant investment in bitumen, polymers and blending capability
- In house blending and testing
- Tailor made polymer modified binder (pmb) for varying conditions
- An engineered product



The conversation, single use plastics

THE CONVERSATION

Academic rigour, journalistic flair

Q Search analysis, research, academics...

Arts + Culture Business + Economy Cities Education **Environment + Energy** Health + Medicine Politics + Society Science + Technology Brexit

Pro's;

- Reduces resource use and negative environmental impacts associated with their manufacture.
- Reduces a major contaminant of kerbside recycling

Con's;

- Increase in sales of heavier (more plastic) plastic waste bags
- Drives the use of alternatives with potentially higher environmental impacts
- We've moved the problem

In banning plastic bags we need to make sure we're not creating new problems

July 20, 2017 9.09pm BST

Ever thought about it?

Environmental Impact Report

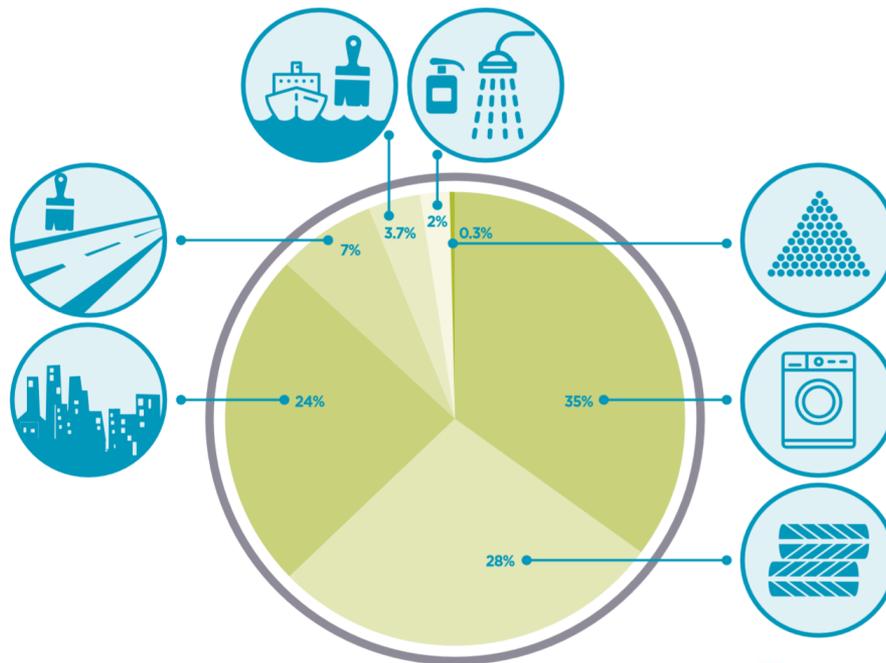


Disposable vs Reusable

Some data to think about....

GLOBAL RELEASES OF PRIMARY MICROPLASTICS TO THE WORLD OCEANS

BY SOURCE (IN %).



Two-thirds of the releases are from the erosion of synthetic textiles & tyres

We need to consider carefully the components used to create our infrastructure



The bigger picture

Microplastics – The elephant in the room for highway pollution?

Formerly of the Environment Agency, Jo Bradley, market development manager at SDS Limited, discusses new research into the dangers of microplastics from road run-off

For most of us, checking our tyre tread wear is a familiar routine - but have you ever stopped to consider where all that lost rubber ends up? It must go somewhere – and if you haven't given it a second thought until now, you won't be alone.



Surface water pollution from highway run-off is known to contain chemicals that are toxic to the aquatic environment and to inhibit reproductive success in aquatic invertebrates. It comes not just from tyre wear, but also from brake erosion, exhaust fumes and oil spills. Silt and sediment is suspended in the run-off and settles out in river beds and streams, where it can clog and choke the biosystem. Hazardous pollutants bind to the sediment, which includes plastic particles from tyre abrasion.

An example...

- Quality products
- Compatible with engineered polymers
- Offer value and tailor made solutions

Step change in RAP usage on UK roads



Monday, October 7, 2019 - 15:05

<https://www.agg-net.com/news/step-change-in-rap-usage-on-uk-roads>

M25 becomes first road on strategic network to be resurfaced with 50% reclaimed asphalt pavement

FM Conway's expertise in recycled materials has allowed an asphalt surface course containing 50% recycled content (RAP) to be laid for the first time on the UK's strategic road network. The material was laid on a section of the M25 between Junctions 25 and 26 during an overnight closure last month (September).

Lets not lose sight of future generations..



Are we thinking holistically?

Or are we a dumping ground for everyone else's waste?

What sort of legacy are we leaving?

New products, new rules?

Looking ahead;

Environmental cost indices (ECI)?

Environmental Prices Handbook EU28 version

Methods and numbers for valuation of environmental impacts

Environmental prices are prices for the social cost of pollution, expressed in Euros per kilogram pollutant. Environmental prices indicate the loss of economic welfare that occurs when one additional kilogram of the pollutant finds its way into the environment. The loss in human health, ecosystem services and quality of buildings and materials that is caused by pollution is captured in a single monetary unit that can be used in social cost-benefit analysis, environmental profit and loss accounts and as a weighting factor in lifecycle analysis.

The present EU28 version of the Environmental Prices Handbook provides a description of the methodological choices that have been made in the calculation of these prices and comes up with examples how they can be used. Environmental prices in this handbook provide average values for the EU28 emissions from an average emission source at an average emission site in the year 2015 for over 500 pollutants. The methodology used in this Environmental Prices Handbook is designed to harmonize the values at pollutant, midpoint and endpoint level, to achieve consistent valuation of the impacts of pollution in the EU28.

The webtool is only [available for Dutch Environmental Prices](#).

[Source: https://www.cedelft.eu/en/publications/2191/environmental-prices-handbook-eu28-version](https://www.cedelft.eu/en/publications/2191/environmental-prices-handbook-eu28-version)



[Source: https://www.shell.com/energy-and-innovation/new-energies/nature-based-solutions.html](https://www.shell.com/energy-and-innovation/new-energies/nature-based-solutions.html)

Carbon offsetting?

A few final thoughts

Consider that a person who celebrates their 100th birthday in 2050 will have seen the human population explode from 2.5 billion to 9.2 billion.

(That is growth equivalent to a city the size of London every month for a century...how do we create capacity for that?).

Ever thought about other changes we might see,
For example will we need a language archive?
Will we lose the ability to write?



And remember, whatever the product, service or technology, a weed is a plant in the wrong place...



No “one-size-fits-all” solution

Thank you

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