



Thursday October 18th – 6.15pm – Zeeman, MS01

# **WARWICK SUSTAINABILITY SUMMIT**

# **University Today**

Keynote

Talk 1: Global Sustainable Society

Talk 2: Climate Reality

Talk 3: Warwick Behaviour Science Group

Panel



WARWICK

ENVIRONMENTAL  
SUSTAINABILITY

# Warwick Sustainability Summit 2018

18<sup>th</sup> October 2018

Joel Cardinal | *Head of Energy & Sustainability*

# Agenda

Warwick Campus today

Context – a growing campus

Delivering UK Climate Change commitment

Even bigger challenge

Collaborating with students – a new relationship

# University of Warwick – An Overview



- Ranked 7th overall in the UK (*The Times, 2017*)
- Four departments ranked as the leading in the country.
- 87% of our research is ‘world -leading’ or ‘internationally excellent’
- 19 departments in the top 10 in the UK
- WMG (Warwick Manufacturing Group)
- WBS – Global MBA’s
- Sciences Park
- Conferences



# Our Students

WARWICK

- One of the largest University campus in Europe.
- 25,615 students
- 6,294 academics, researchers and staff
- 7,000 accommodation rooms



# Main Campus

“a 24/7/365 town of 30,000 people”

- 560,000m<sup>2</sup> built
- 290 Hectares
- 7,000 students rooms
- More than 150 buildings
- 3 conference centres
- 2 Sport centres
- Retail / cafes / restaurants
- Arts Centre
- Offices & teaching buildings
- Industrial & Research buildings
- 19km heating/cooling network
- Self-generate at least 50% of heat and power needs



## Our Wellesbourne Campus

- 215 Hectares of Research & farming
- Research and Business park



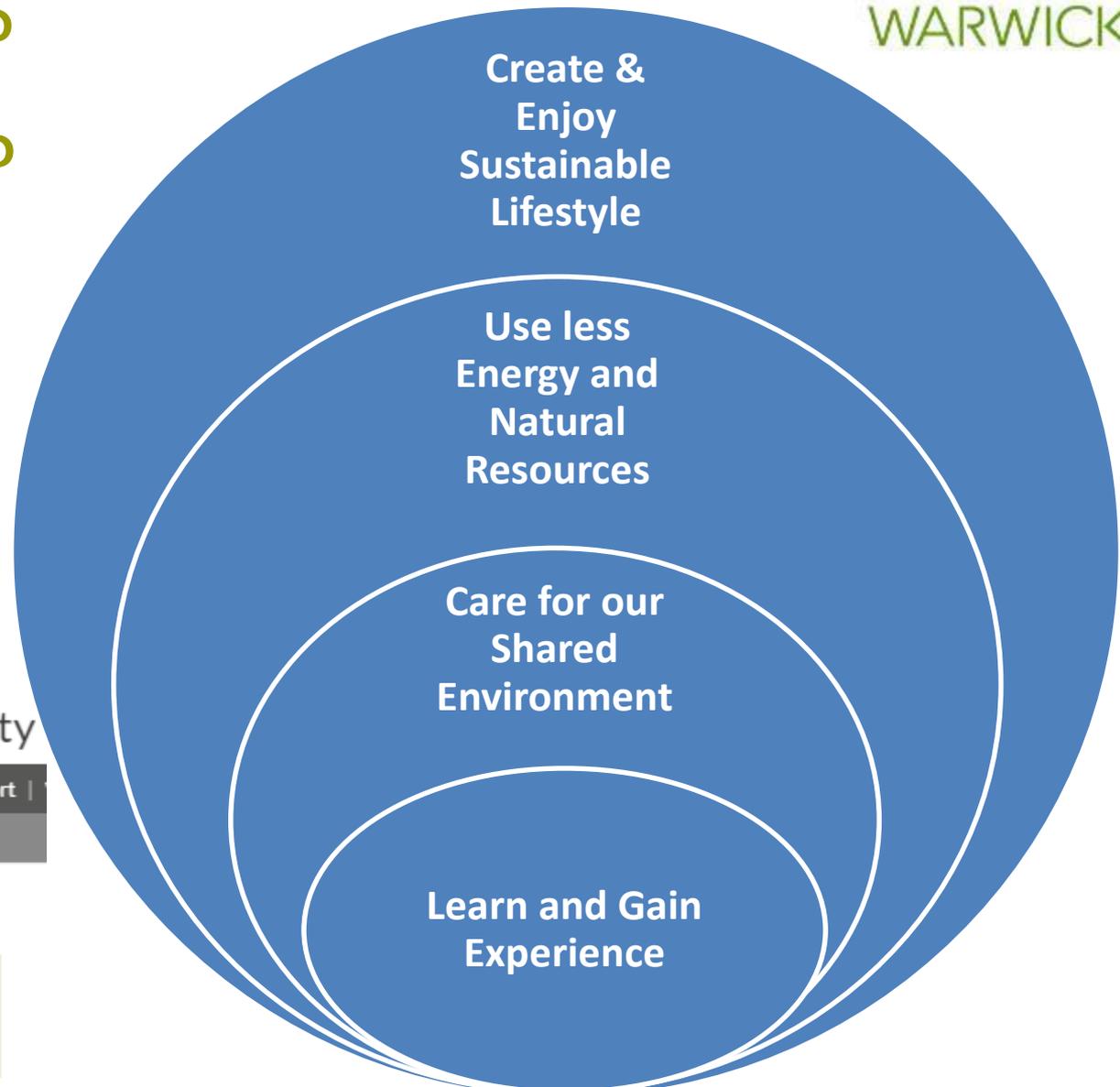
# Our Energy Profile

WARWICK

2015/16 main campus	Typical Annual Figures	UK Household Equivalent
Total Utilities Cost	£8.3m	6,500 homes (£1,272 pa)
Electricity Consumption	72 GWh (50%+ self generated)	17,500 homes (4,100 kwh pa)
Gas Consumption	161 GWh	10,000 homes (16,000 kwh pa)
CO <sub>2</sub> emissions	40,421 tonnes	7,476 homes (5.35 tCO <sub>2</sub> pa)
Water Consumption	589,000m <sup>3</sup> (589 million litres)	4,500 homes (360 litres per day)

Who we are ?

What we do ?



Environmental Sustainability

[Get Involved](#) | [News and Events](#) | [Recycling](#) | [Transport](#) |

[Contact us](#)

Contact us

<https://www2.warwick.ac.uk/about/environment/>

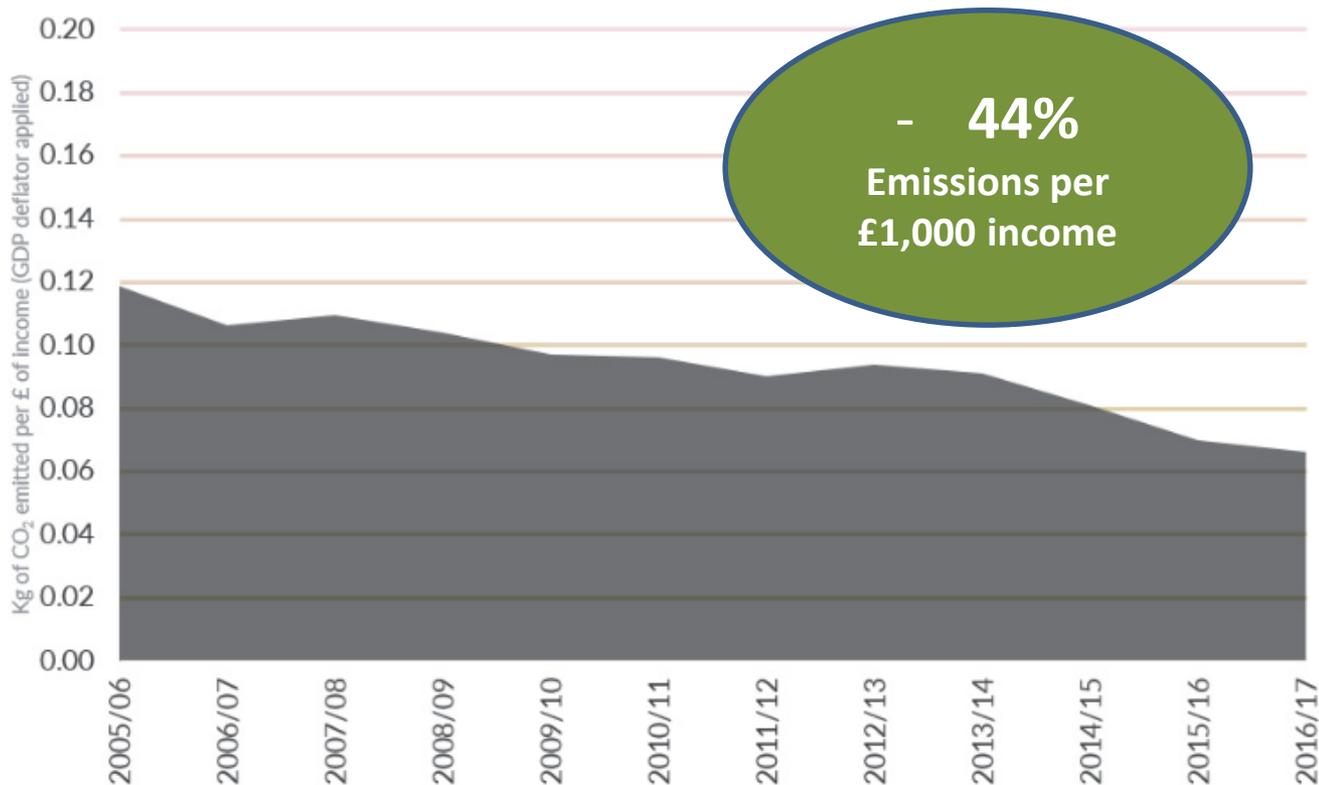
[https://warwick.ac.uk/about/environment/get\\_involved/video](https://warwick.ac.uk/about/environment/get_involved/video)

# CO<sub>2</sub>e Emissions Improvement

WARWICK

## Efficiency: Carbon emitted per £ of income

In the graph below you can see how the carbon efficiency of the University has dramatically improved over recent years. This trend, which we aim to continue, has seen our efficiency almost double since 2005/6.



- 🔌 We generate 60% of our electricity and hot water on campus through an efficient [Combined Heating and Power](#) system.
- 🏠 We opened the [Cryfield Energy Centre](#) in 2014 to provide more super-efficient combined heating and power for campus.
- 🏗️ Making sure all the [new buildings](#) we add to campus are much more efficient than the older ones they're replacing.
- ♻️ We worked to add more [renewable energy sources](#) to campus.
- 💧 We worked to cut our Water use - water cleaning produces emissions too.
- 🌱 Our staff and students have made a real effort to think in a more sustainable way.

# 2017/18 Energy Report



- University emissions increase by 1,421 tonnes (3.6%)
- Electricity consumption increased +10% (against 5 year av. increase of +1.8% p.a)
- Water consumption increase +4.7%
  - (irrigation [e.g. 60% increase on Cryfield Sports alone] + Hockey pitch + Sherbourne 7, 8, 9)

## Significant Increases (+ 1,764 tonnes CO2)

- + 700 tonnes from NAIC Electricity
- + 550 tonnes from Heat Network issues (estimated)
- + 234 tonnes from Sherbourne 7,8, 9 (20% below “budget”)
- + 188 tonnes from I-ERA, T-ERA
- + 92 tonnes from Construction Sites

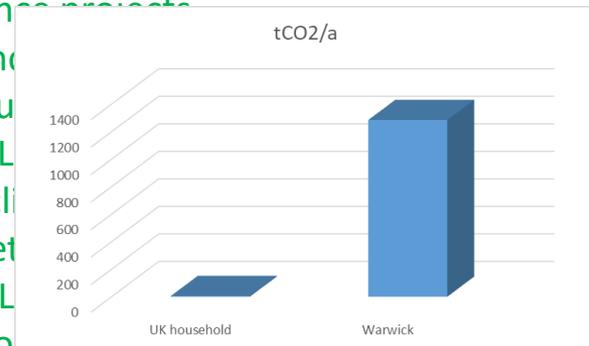
## Remaining +945 tonnes likely causes

- Colder winter (+7% Heating degree days)
- Warmer summer (+61% Cooling degree days)
- Activity (more staff, students, conferences and research)?

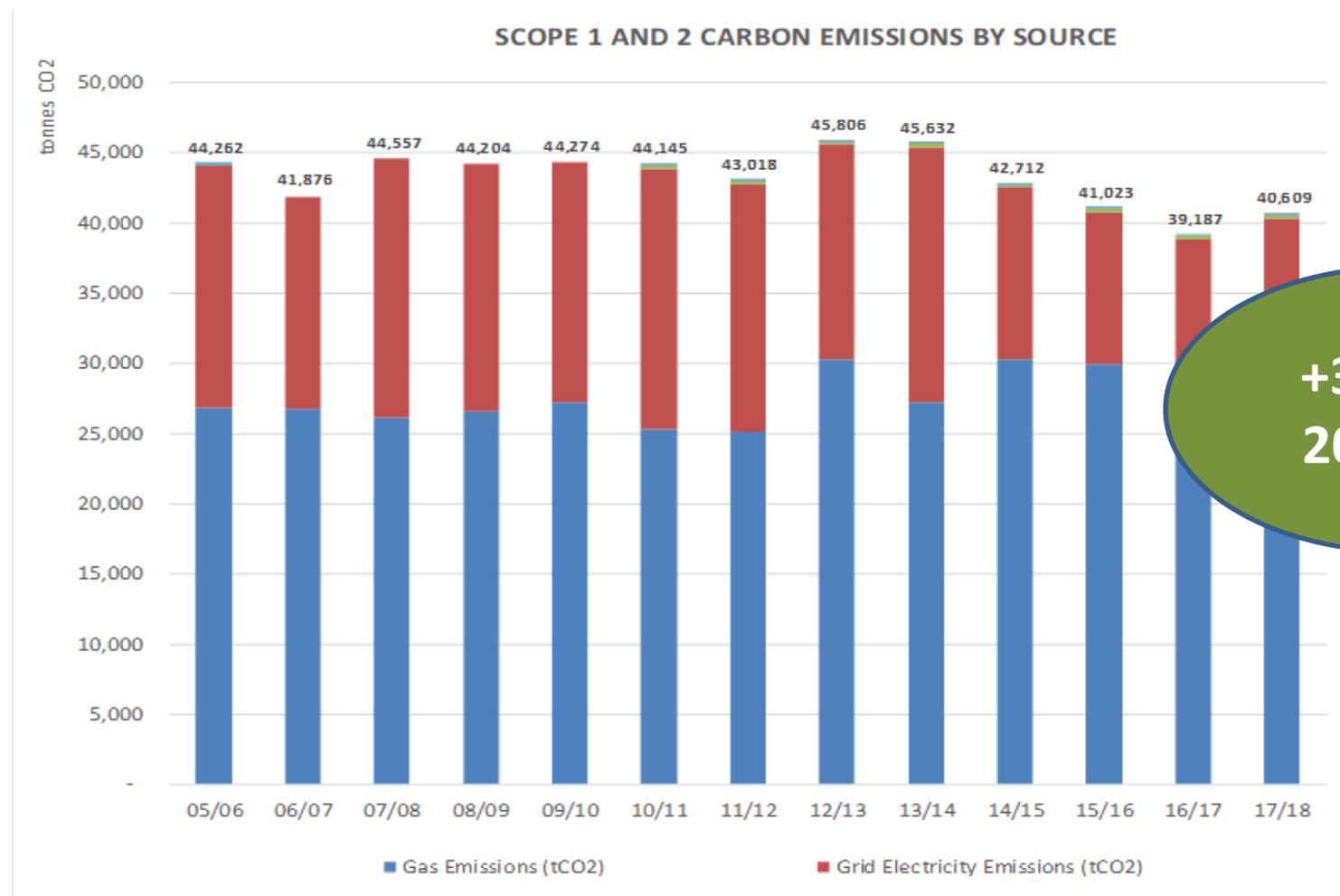
## Significant Reductions (- 1,288 tonnes CO2)

- -745 tonnes from Grid Electricity decarbonisation
- -152 tonnes from Operational Energy Management
- - 391 tonnes from Carbon reduction and maintenance projects

- Science
- Arthur
- IMC L
- Radcl
- Street
- Low L
- and others



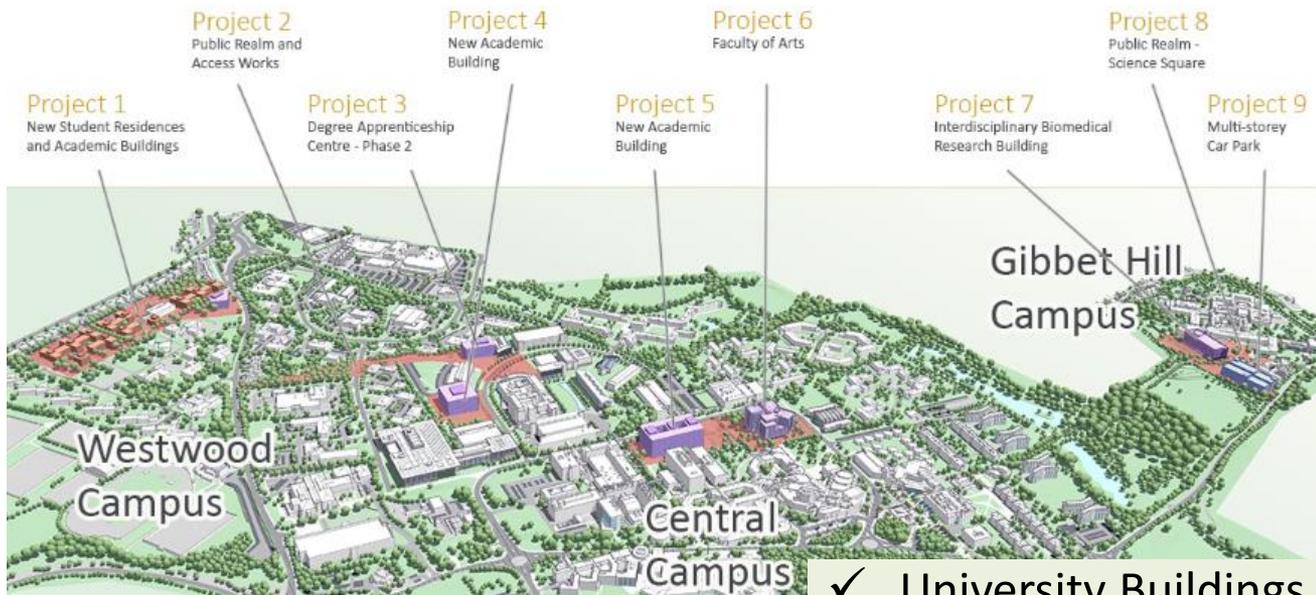
# 2017/18 Emissions Increase



# Successful University Growth

WARWICK

Next page »



Interdisciplinary Biomedical Research Building: artist's impression

itation for  
itted to playing  
place to study,

09. This  
ental quality,  
sity's strength



Mathematical Sciences Building - CGI

- ✓ University Buildings are 20-30% better than Buildings Regulation
- ✓ We continuously work on comfort, efficiency and performance



Mathematical Sciences Building - CGI



National Automotive Innovation Centre - CGI

# UK Climate Change Commitment

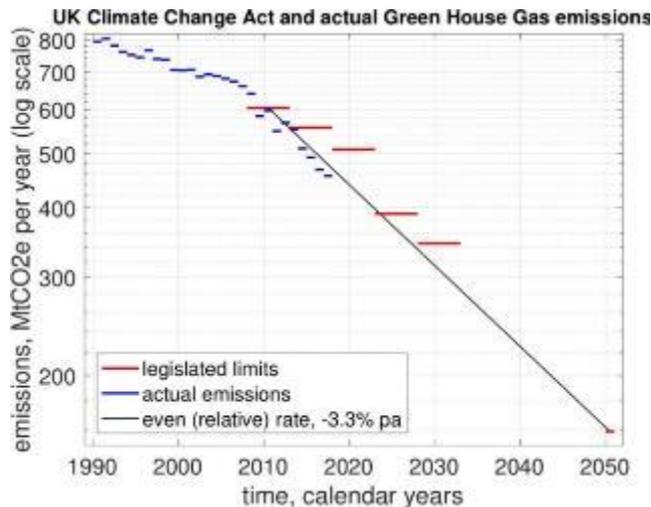
WARWICK

## CARBON EMISSIONS – UK LANDSCAPE

### UK Climate Change Targets Commitment & Pledge



The [Climate Change Act 2008](#) sets legal limits on the green house gas emissions for the UK and specifies a reduction of green house gases by 2050 of 80% relative to the emissions in the year 1990.



The prime minister announced in her address to the 73rd session of the UN General Assembly in New York last week that the UK will join the Carbon Neutrality Coalition.

Set up to promote “long-term planning and ambitious action” in support of the Paris Agreement’s collective goals of net-zero global emissions.

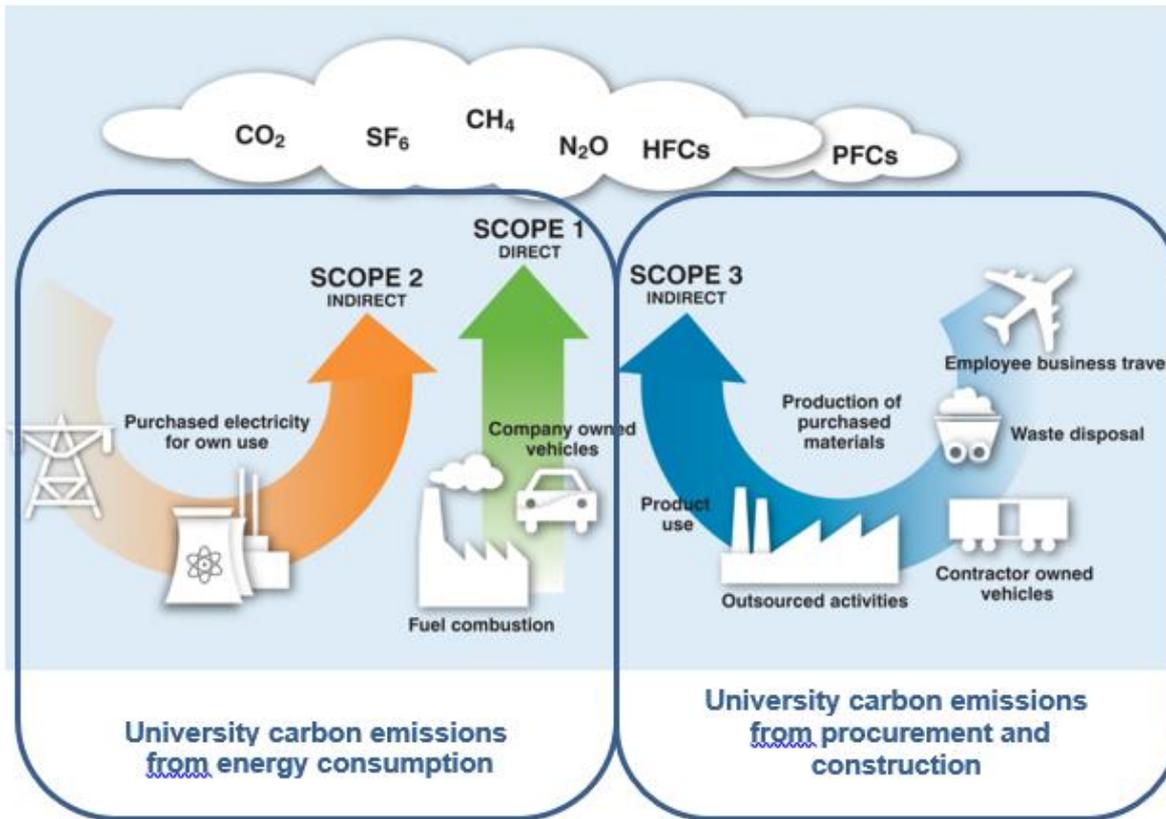
Involves reducing emissions to as close to zero as possible, with any left-over carbon soaked out of the atmosphere by, for example, planting trees.

The world-wide agreement states that emissions must be cut to net zero by the middle of this century to prevent runaway temperature rises.

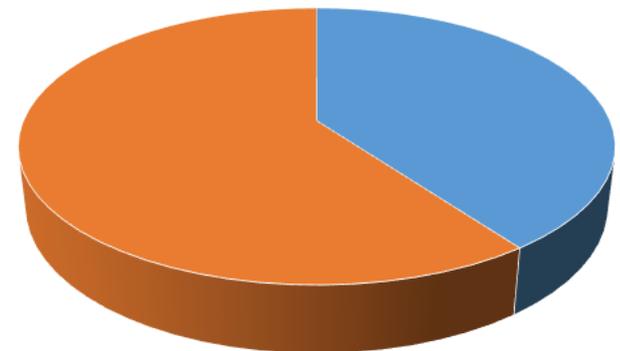
<https://www.gov.uk/government/news/uk-expertise-to-help-developing-countries-tackle-climate-change-and-move-to-cleaner-energy>

# UK Climate Change Commitment

WARWICK



We all have an influence on all scopes 1, 2 and 3



University can lead / facilitate only

- Controlled by Estates
- Triggered by end users

# UK Climate Change Commitment

WARWICK

## New Waste & Recycling Signage

- ✓ Easier to understand
- ✓ Reduce contamination
- ✓ Protect environment

### Clean Recyclables



NO FOOD or LIQUIDS. NO GLASS - Please use your nearest glass recycling point  
For more information visit [www.warwick.ac.uk/recycling](http://www.warwick.ac.uk/recycling)

### Non-Recyclables



NO LIQUIDS. NO GLASS - Please use your nearest glass recycling point  
For more information visit [www.warwick.ac.uk/recycling](http://www.warwick.ac.uk/recycling)

### Broken Glass & Sharps



DON'T FORGET - Take your glass bottles to your nearest bottle recycling bank  
For more information visit [www.warwick.ac.uk/recycling](http://www.warwick.ac.uk/recycling)

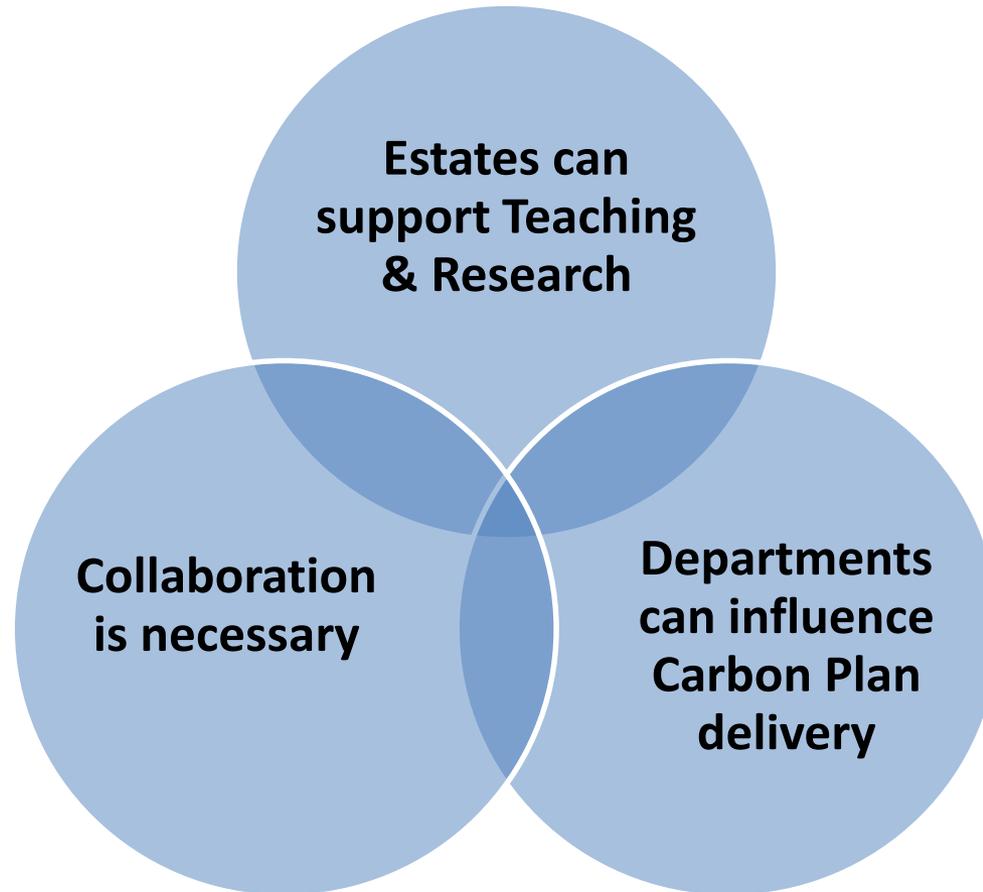
## Beyond scope 3

# Sustainable Development Goals More from this by Farooq

- Need collaboration of organisations and individuals
  - For example UN SD goal 12 – responsible consumption
    - We always welcome initiatives
      - Projects, awareness, lead by example
- Get involved – Join our Green Champions network

# Only achievable through a Coordinated Action Plan

WARWICK



# Got an idea?

Let's make it happen!

Post it online at:

**The Sustainability Hub**

Apply for SU funding through:

**The Environmental Sustainability Fund**

£5,000 available to all students and staff



# Submit your idea...

WARWICK

Project Proposals 

## Tell us about your project - your project proposal

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Project name

Project description

Our project is about ...

Name of project lead

Contact email address

How long is project set to run for



Who is currently funding/and or sponsoring the project?

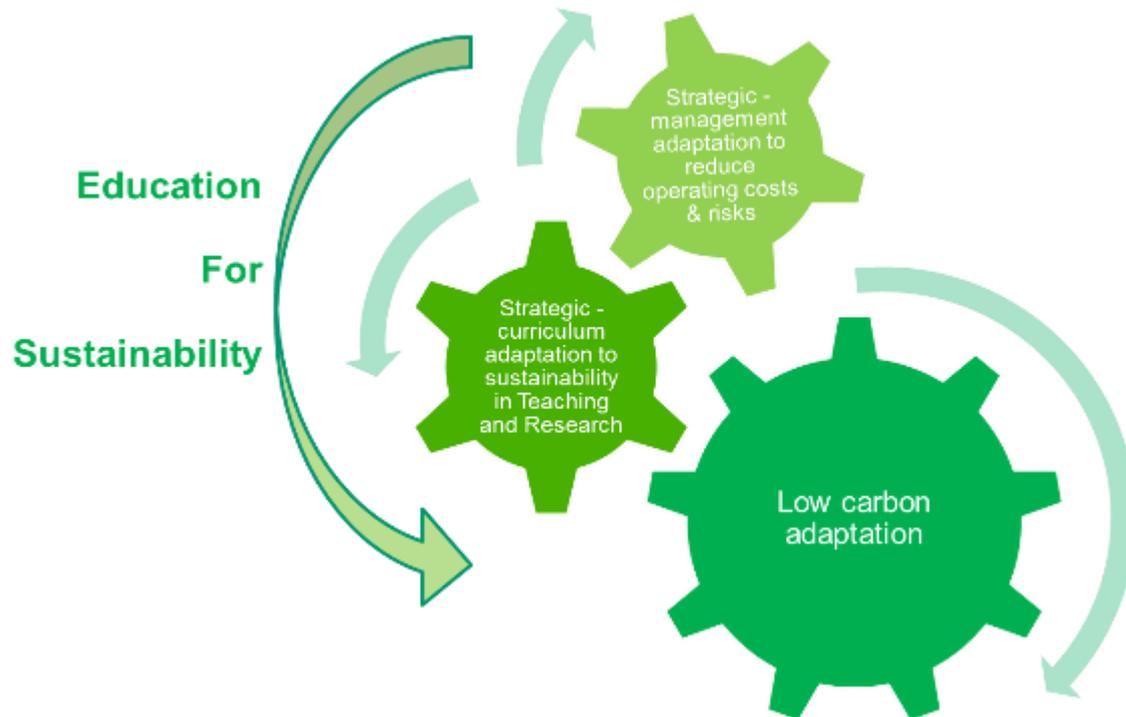
What we're looking to achieve/do in long term

# Global Approach to Sustainability

WARWICK

“In the end, we will protect only what we love. We will love only what we understand.  
We will understand only what we are taught.”

Baba Dioum, Senegalese poet and naturalist



Come and join us.

Your ideas welcome.

Research and industrial  
partnerships.

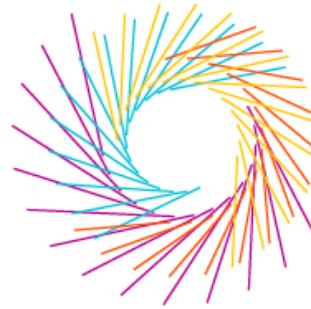
University Today

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Panel



**CDR**  
CENTRE FOR  
DEVELOPMENT  
RESULTS

# Warwick Sustainability Summit

*18 October 2018*

Farooq Ullah



# Misconceptions of SD



1. Nobody knows what sustainability really means.
2. Sustainability is all about the environment.
3. “Sustainable” is a synonym for “green.”
4. It’s all about recycling.
5. Sustainability is too expensive.
6. Sustainability means lowering our standard of living.
7. Consumer choices and grassroots activism, not government intervention, offer the fastest, most efficient routes to sustainability.
8. New technology is always the answer.
9. Sustainability is ultimately a population problem.
10. Once you understand the concept, living sustainably is a breeze to figure out.

Scientific American: <http://www.scientificamerican.com/article/top-10-myths-about-sustainability/?page=1>

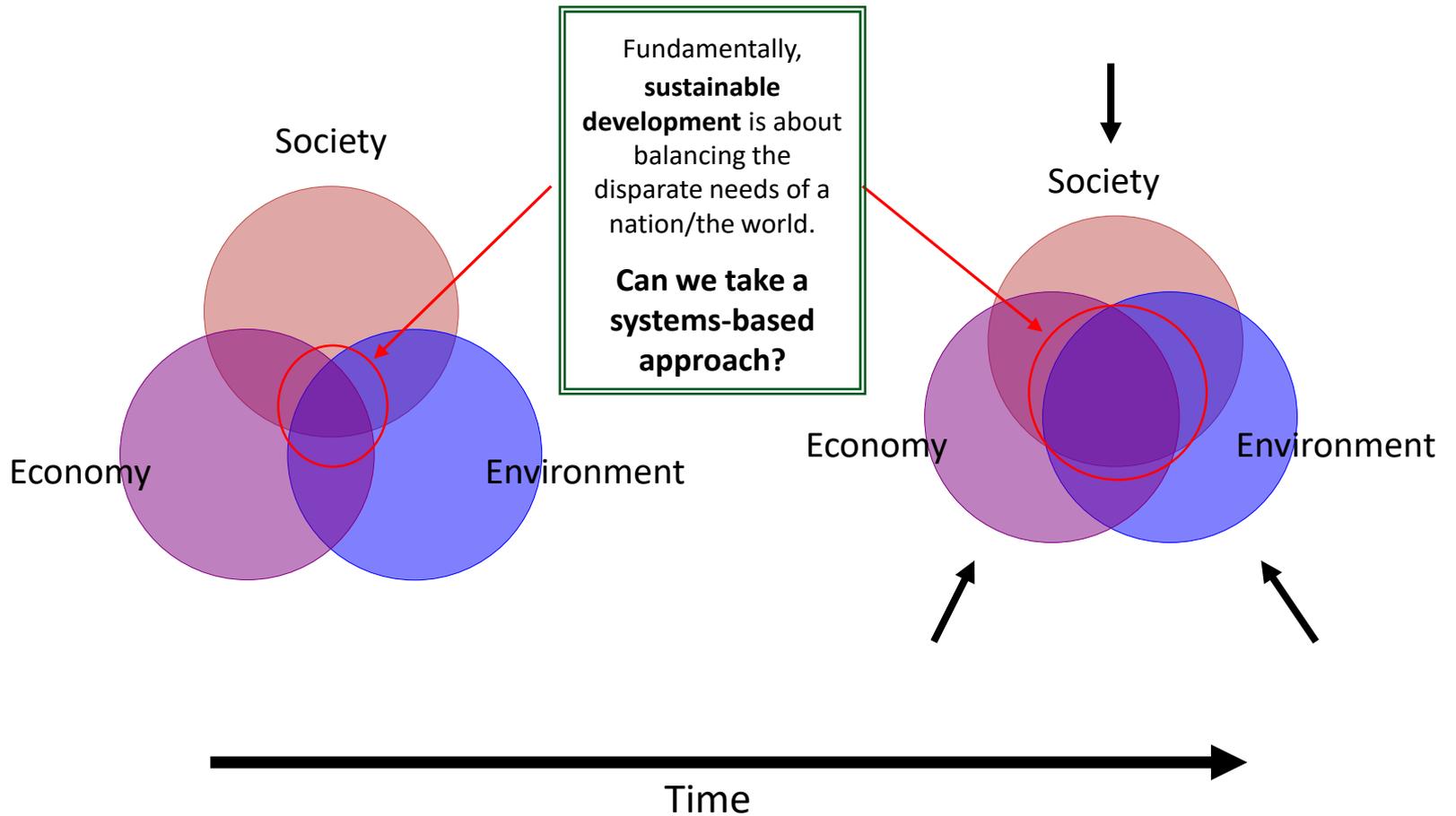


# Defining SD



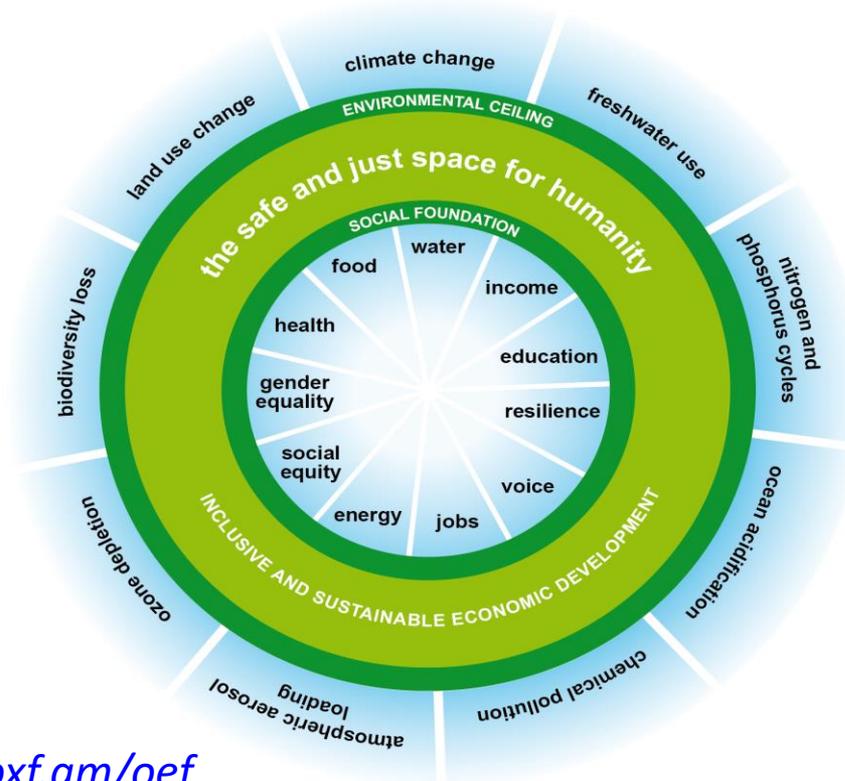
- Bruntland Report:
  - The Report of the Brundtland Commission, Our Common Future (1987), and was ‘welcomed’ by the General Assembly Resolution 42/187
  - Key definition: *“sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”*
    - Two key concepts within:
      - Needs
      - Future Generations

Balancing the needs of our world



# The Great Balancing Act

The balancing act is how the two fundamental elements of sustainable development and how these must be considered together; that is planetary health and social justice. Together these two elements describe a sustainable vision that respects both **planetary boundaries/environmental limits** and a **social foundation**, which will ensure a safe and just operating space for our existence and defines new pathways for inclusive growth and prosperity.



Source: Oxfam - <http://oxf.am/oef>



# The SDGs



- Goal 1 - End poverty in all its forms everywhere
- Goal 2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Goal 3 - Ensure healthy lives and promote well-being for all at all ages
- Goal 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 5 - Achieve gender equality and empower all women and girls
- Goal 6 - Ensure availability and sustainable management of water and sanitation for all
- Goal 7 - Ensure access to affordable, reliable, sustainable and modern energy for all
- Goal 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation



# The SDGs (cont'd)



- Goal 10 - Reduce inequality within and among countries
- Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12 - Ensure sustainable consumption and production patterns
- Goal 13 - Take urgent action to combat climate change and its impacts\*
- Goal 14 - Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- Goal 16 - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- Goal 17 - Strengthen the means of implementation and revitalize the global partnership for sustainable development

*\* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change*



# SUSTAINABLE DEVELOPMENT GOALS

<b>1</b> NO POVERTY 	<b>2</b> ZERO HUNGER 	<b>3</b> GOOD HEALTH AND WELL-BEING 	<b>4</b> QUALITY EDUCATION 	<b>5</b> GENDER EQUALITY 	<b>6</b> CLEAN WATER AND SANITATION 
<b>7</b> AFFORDABLE AND CLEAN ENERGY 	<b>8</b> DECENT WORK AND ECONOMIC GROWTH 	<b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE 	<b>10</b> REDUCED INEQUALITIES 	<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	<b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION 
<b>13</b> CLIMATE ACTION 	<b>14</b> LIFE BELOW WATER 	<b>15</b> LIFE ON LAND 	<b>16</b> PEACE, JUSTICE AND STRONG INSTITUTIONS 	<b>17</b> PARTNERSHIPS FOR THE GOALS 	 <b>SUSTAINABLE DEVELOPMENT GOALS</b>



# 4 Key SDGs Principles/Concepts



1. Universality
2. Leave No One Behind
3. Integration
4. Multi-stakeholderism



# MDGs vs. SDGs



- There are several important and fundamental differences between the MDGs and the SDGs:
  1. Shift from economic growth to sustainable development as the answer to the poverty problem
  2. Greater focus on the root causes of poverty, e.g.:
    - Environmental degradation
    - Inequalities
    - Poor or lack of governance
  3. MDGs applied to developing countries only, whereas the **SDGs are global in nature and universal in application.**
    - This means that the SDGs apply to both developing and developed countries



## Tensions within SDG Framework

- There is a need to balance short-term poverty ***alleviation*** against long-term poverty ***eradication***
- This is a risk of policy incoherence:
  - There are potential for goals to compete or even conflict, e.g. economic growth and consumption & production.
- It is a large and very broad agenda:
  - Is it communicable? Will children understand?
  - The number of goals remains contentious, but unlikely to change.
- Means of Implementation (MOI) vs. actual implementation – Not legally binding.



# Means of Implementation (MOI)



- The UN Technical Support Team (TST) brief defines MOI as:
  - the interdependent ***mix of financial resources, technology development and transfer, capacity-building, inclusive and equitable globalization and trade, regional integration, as well as the creation of a national enabling environment*** required to implement the new sustainable development agenda, particularly in developing countries.



# Challenges of MOI



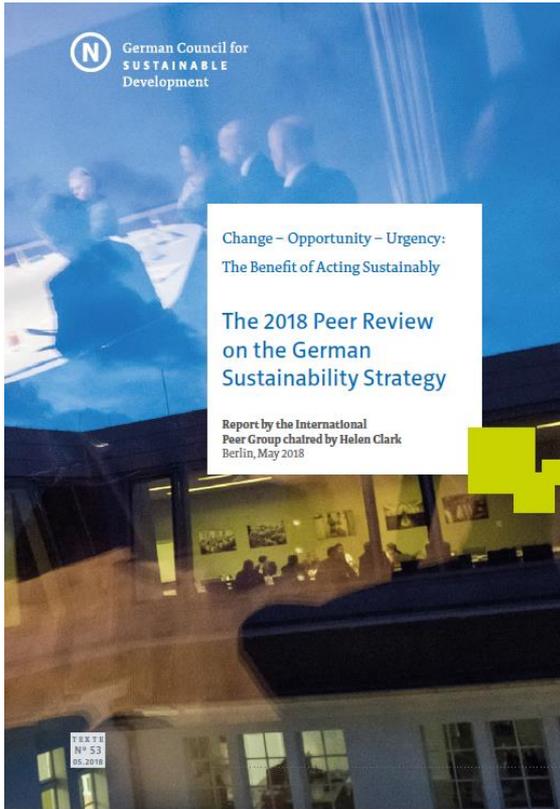
1. Universality remains largely undefined despite increasing number of studies on the concept
2. While the principle is fundamental, the practice of CBDR is often hijacked and used a stick to hold developed countries hostage.
3. Finding innovative sources of financing beyond traditional overseas development aid (ODA).
4. Tech transfers remains contentious and at odds with intellectual property rights and the profit incentive.
5. Accountability is not legally-binding; so where is the enforcement?
6. How can soft and hard legal and regulatory measures be brought to bear?
7. Science is often overlooked in implementation.



# Challenges of MOI (cont'd)



7. There is a massive data challenge: we don't know how to measure, collect or report the information we need for report. In many cases (e.g. for SDGs and/or in countries), data simply does not currently exist.
  - 3% data gap In the UK. Down from 29%
8. There is a lack/incoherence of governance arrangements
9. Policy incoherence remains within the SDG Framework as well as in relevant policy-making spheres.
10. The concept of partnerships is vague and undefined, but used freely and loosely.
11. Despite great improvements on stakeholder engagement in SDGs process, true participation in decision-making/shaping remains unfulfilled in all places and at all levels.



# UK



@ukssdnetwork #MeasuringUp #SDGs

## Measuring up

How the UK is performing on the  
UN Sustainable Development Goals



# UKSSD



The UKSSD network supports organisations who are working to advance sustainable development and helps to facilitate the delivery of the SDGs in the UK.

We are multi-stakeholder, representing organisations from the UK that span the business, civil society, academic and public spheres, irrespective of their interests, size or location.



**Influence**



**Inform**



**Inspire**

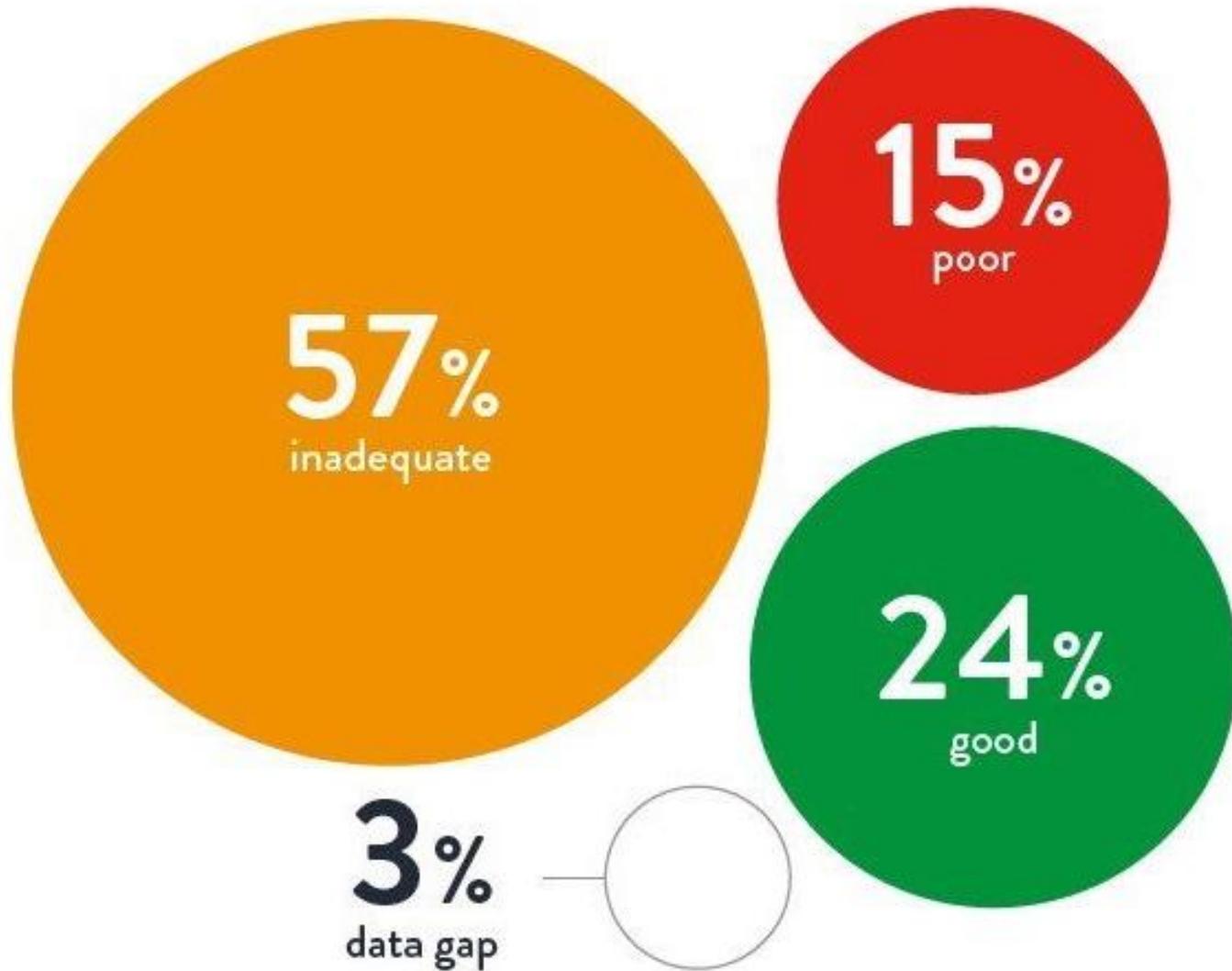
@ukssdnetwork

**Join Us!!!!:**  
[www.ukssd.co.uk](http://www.ukssd.co.uk)

#sustainableUK



## Measuring up: How the UK is performing on the SDGs







# The Small Challenge



- UNCTAD (World Investment Report 2014) estimates global investment needs for realisation of the SDGs is on the order of \$5 trillion to \$7 trillion per year.
  - \$75 trillion - \$105 trillion globally
- Estimates for developing countries alone range from \$3.3 trillion to \$4.5 trillion per year.
  - \$49.5trillion - \$67.5 trillion for developed countries
  - Approximately 65% of total
- In 1994, UN estimated \$600 billion per year for implementing Agenda 21



# The Big Challenge



- Achievement of the Small Challenge is irrelevant in the face of the Big Challenge.
- The Big Challenge – the amount of money/capital still spent on unsustainable activities/investments
  - This investment likely dwarfs the amount spent on SD generally and the SDGs specifically
  - It will cancel out the efforts and achievements of the SDGs
- ***The challenge, therefore, is twofold:***
  - ***not only how much good investment we can raise, but also how much bad investment can be avoided.***
- Bain estimates global capital\* to be:
  - 2010 - \$600 trillion, tripling over past two decades
  - 2020 - \$900 trillion (estimated)

\*<http://www.bain.com/publications/articles/a-world-awash-in-money.aspx>



# Economic Case for Action

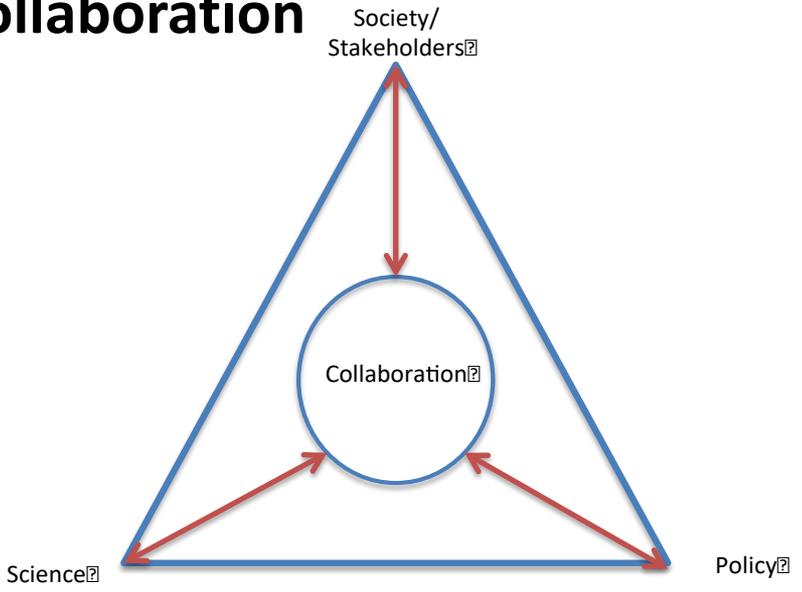
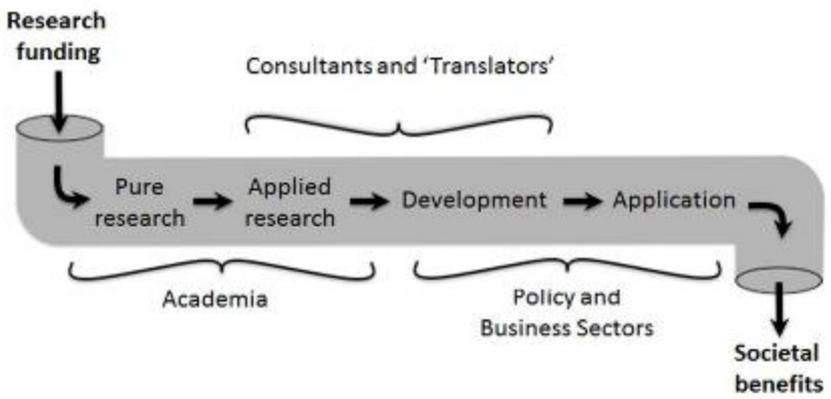


- Understanding the economics of the SDGs will be crucial to their achievement.
  - *What is the distribution and redistribution of resources (both financial and non-financial) that are required in order to achieve the SDGs and thereby receive the benefits (environmental, economic and societal) derived from the achievement of such global goals?*
- Therefore, we need build a compelling economic case for action on the SDGs, including the cost of inaction
  - Expressed in terms and outcomes which have resonance with decision-makers:
    - E.g. GDP, jobs, education, Gini Index, social cohesion, equalities, well-being and environmental impact & health
- Also highlight new economic opportunities from SD



## From "Mode 1" to "Mode 2"

Consultation → Collaboration



### Knowledge production in "Mode 1"\*

- Academic context
- Disciplinary (sometimes multi-disciplinary)
- Homogeneity
- Autonomy
- Traditional quality control (peer review)

### Knowledge production in "Mode 2"

- Context of application
- Transdisciplinary
- Heterogeneity
- Reflexivity/social accountability
- Novel forms of quality control

\*Source: Hessels and van Lente, 2008: 741



# Four Types of Fairness



Do we need a new, more relevant, more compelling framework for analysis and discussion?:

1. Interpersonal
2. Inter-societal
3. Inter-biological
4. Intergenerational



# Thank You!



- 1. Multi-stakeholderism is the operational answer to the LNOB challenge/principle**
- 2. Partnerships are the operational answers to the integration challenge**

**Farooq Ullah**

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[www.centre4developmentresults.org](http://www.centre4developmentresults.org)

[www.ukssd.co.uk](http://www.ukssd.co.uk)

- Executive Director, Centre for Development Results (CDR)
- Co-Founder & Co-Chair, UK Stakeholders for Sustainable Development (UKSSD)

University Today  
Keynote

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Talk 2: Climate Reality

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# WARWICK GLOBAL SUSTAINABLE DEVELOPMENT SOCIETY

Nicola Blasetti – President

Joaquín Salido Castilla – Treasurer

# The GSD Department

- Interdisciplinary
- Tackling complex issues
- Tutors with diverse disciplinary backgrounds
- Students from across the world with various academic interests

The screenshot shows the Warwick University website for the School for Cross-faculty Studies Global Sustainable Development. The header includes the Warwick logo, navigation links (Study | Research | Business | Alumni | News | Engagement), and a search bar. The main navigation bar lists: About Us | Prospective Students | Current Students | Engagement | GSD News | Staff Pages. The main content area features a large image of a person holding a globe with a green landscape on top. A text box overlaid on the image reads: "Don't worry about the future. Fix it. Are you ready for GSD? Discover our unique interdisciplinary undergraduate degree courses." Below the image are three columns of links: "About Us", "Prospective Students", and "Current Students". At the bottom, there are three more sections: "Contact Us" (Part of the School for Cross-faculty Studies), "News" (Mon 15 Oct '18), and "Global Sustainable Development?".

# Sustainable Development Goals



# Modules: Some examples

## First Year

- Environmental, Economic, Social Principles of GSD

## Second Year

- Bodies, Health and Sustainable Development
- Security, Sovereignty and Sustainability in the Food System

## Third year

- Challenges of Climate Change
- The Energy Trilemma
- Human Rights and Social Justice in Latin America and the Caribbean



# Our course(s)

## Economic Studies and GSD



Source: TED.com

# Structure of Economics & GSD

## Year 1:

- 60 credits from GSD:
  - ▣ **Term 1:** Economic Principles of GSD Social Principles of GSD (15 CATS each).
  - ▣ **Term 2:** Environmental Principles of GSD and GSD Mini-Project (15 CATS each).
- 60 credits from Economics
  - ▣ **Term 1:** Mathematical Techniques (12 CATS), Economics 1 (micro, 30 CATS includ. Term 2) and CDA (6 CATS including Term 2&3).
  - ▣ **Term 1:** Statistical Techniques (12 CATS), Econ 1 (macro), CDA.

# Structure of Economics & GSD

## Year 2:

- GSD:
  - ▣ Bodies, Health and Sustainable Development OR Food Systems: Security, Sovereignty and Sustainability (30 CATS)
  - ▣ 30 CATS: Any approved modules with a GSD focus.
- Economics:
  - ▣ Economics 2 (30 CATS)
  - ▣ Applied Econometrics/Econometrics 1 (30 CATS)

# Structure of Economics & GSD

- Year abroad option in year 2 (for all GSD students)
  - ▣ Term 1 at Warwick (60 CATS in total)
  - ▣ Rest of the year at Monash University (Melbourne, Australia)



# Structure of Economics & GSD

## Year 3:

- GSD:
  - ▣ Dissertation (30 CATS)
  - ▣ 30 CATS: Any approved modules with a GSD focus.
- Economics:
  - ▣ Development Economics: Macro (Term 1, 15 CATS)
  - ▣ Development Economics: Micro (Term 2, 15 CATS)
  - ▣ 30 CATS: Modules from Economics department.

# Other degrees

## □ Joint honours

- Business, Hispanic Studies, History, Life Sciences, Philosophy, PAIS, Psychology, Sociology and Theatre and Performance Studies.
- General structure: 60 CATS from GSD department and 60 CATS from joint department per year.

## □ Single honours

- 60 CATS from GSD
- 60 from GSD-related modules (GSD dept. or other)

# Warwick GSD Society

- Department-based Society
- Open to everyone on campus
- Spread awareness about sustainability

A vertical promotional poster for the Warwick Global Sustainable Development Society. At the top is the society's logo, a colorful wreath with 'GSD' in the center. Below the logo, the text reads: **WARWICK GLOBAL SUSTAINABLE DEVELOPMENT SOCIETY**. Underneath, it says: **PROMOTING THE SUSTAINABLE AGENDA • CONNECTING LIKE-MINDED STUDENTS • BUILDING THE FUTURE**. The poster features two circular inset images: one showing a group of people at a table and another showing a person in a field. At the bottom right, there is contact information: **CONTACT US @GSDSOCIETY** with a Facebook icon, and **SUPPORTED BY** with a logo for a supporting organization.

# Our Events

- Academic Talks: Science and Sustainability, Economic Impacts of Climate Change etc.
- Careers Events
- Socials

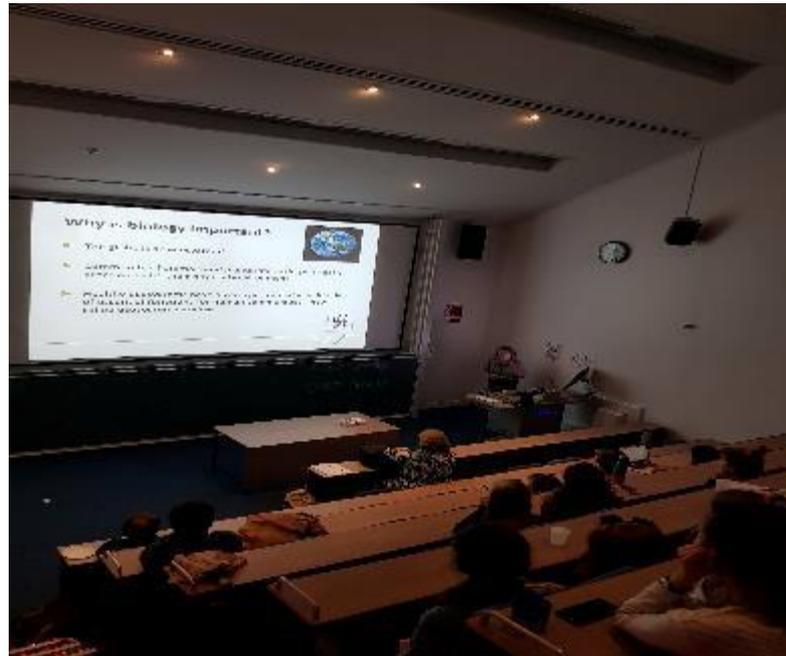


# Running for one year

- Official Society since 2017
- 100+ members in 2017
- Widespread interest in Sustainable Development
- Collaborated with other societies on campus  
(Climate Reality, Warwick Blackout etc.)

# Future

- Beyond our views
  - 'Science and Sustainable Development'
  - Enrich our often 'social sciency' views



# Future

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- Keep bringing our members together
- Careers events
- Keep promoting sustainable development
- ...
- Keep learning!

University Today  
Keynote

Talk 1: Global Sustainable Society

**Talk 2: Climate Reality**

Talk 3: Warwick Behaviour Insights Team  
Panel



# The Climate Reality Project<sup>®</sup>





**15,143**

Climate Reality Leaders Trained



**149**

Countries Represented



**12-86**

Age Range of Leaders





**1. Must we change?**

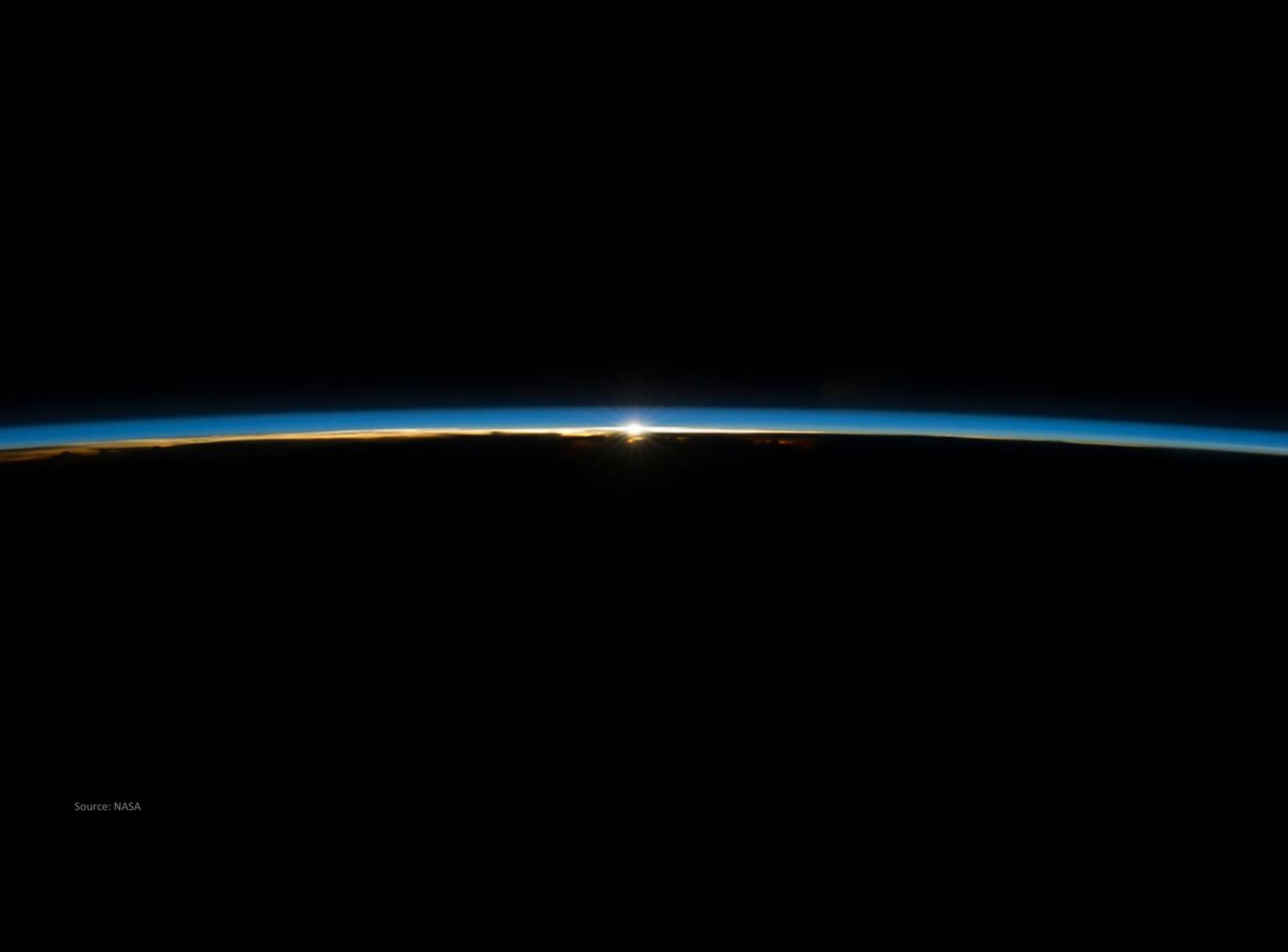
**1. Must we change?**

**2. Can we change?**

**1. Must we change?**

**2. Can we change?**

**3. Will we change?**



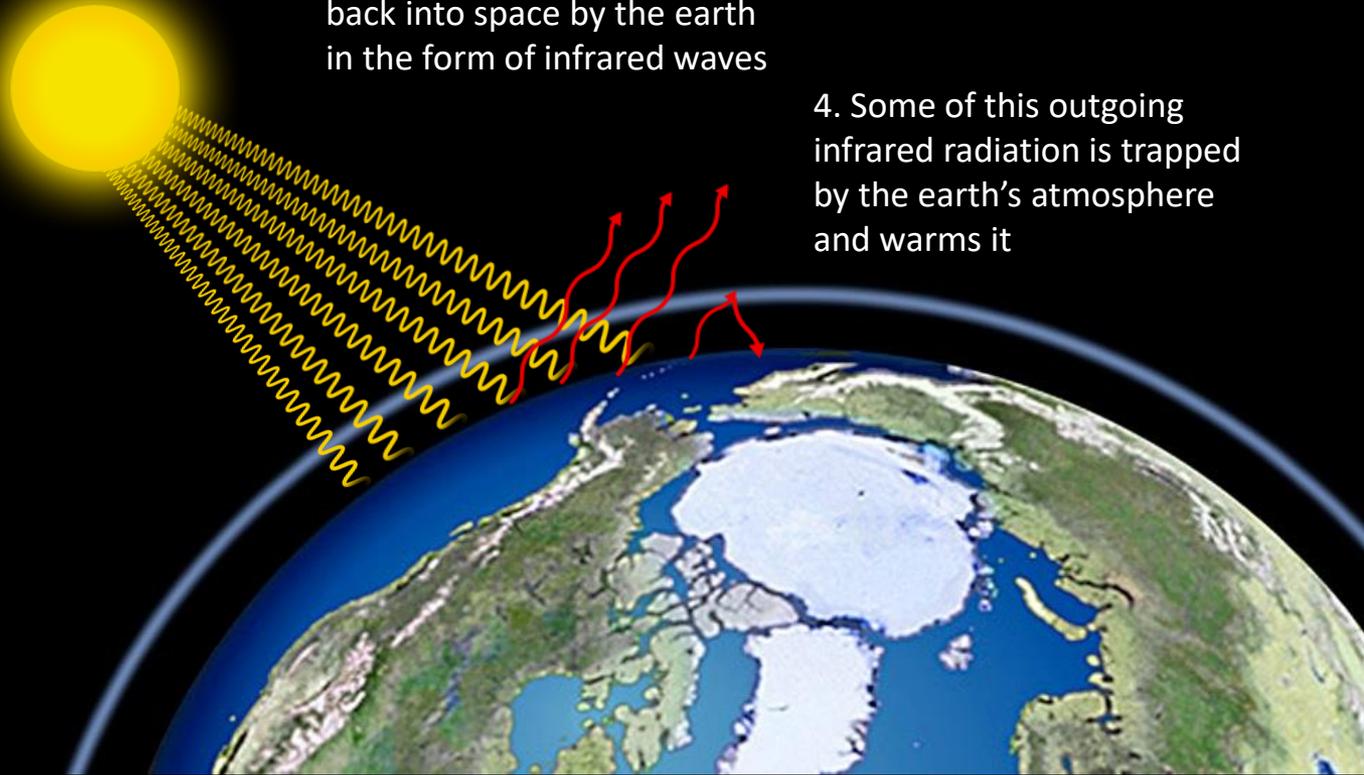
Source: NASA

1. Solar radiation in the form of lightwaves passes through the atmosphere

2. Most of this radiation is absorbed by the Earth and warms it

3. Some energy is radiated back into space by the earth in the form of infrared waves

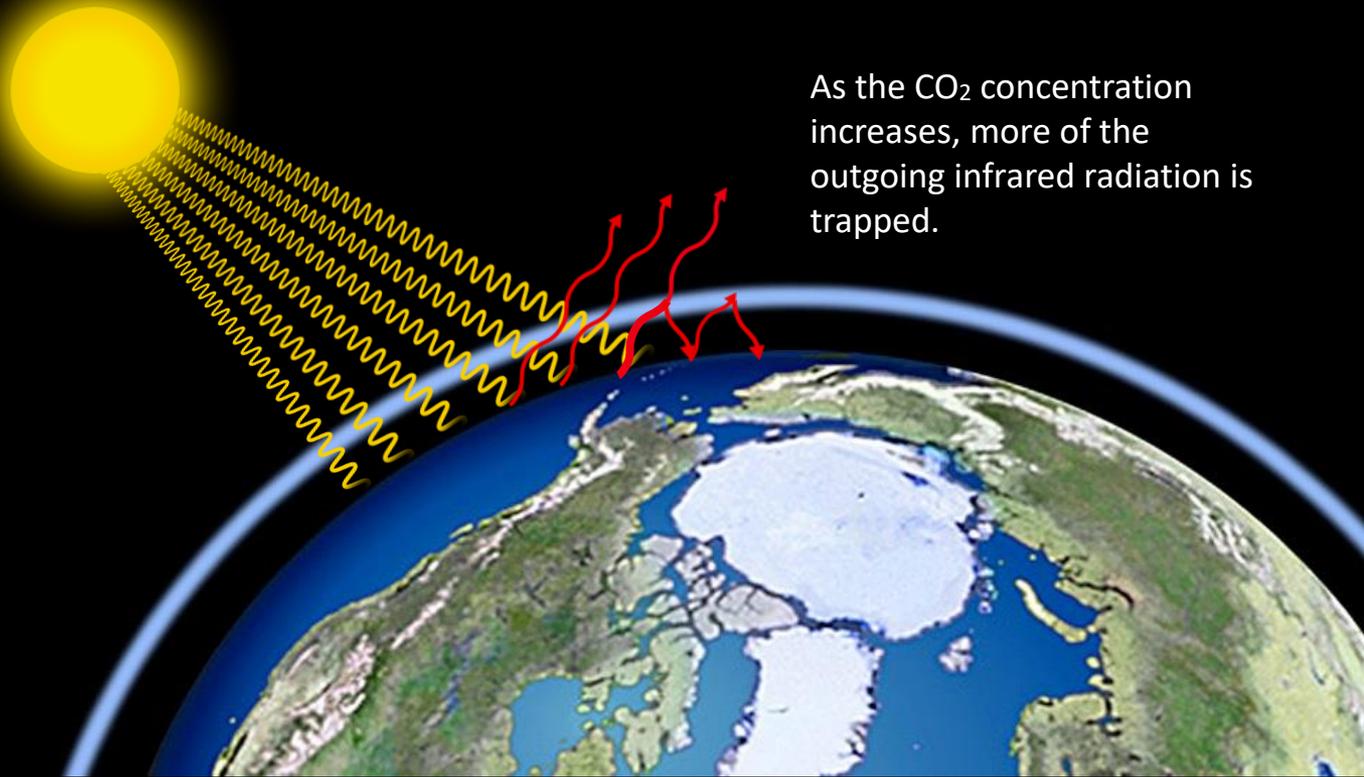
4. Some of this outgoing infrared radiation is trapped by the earth's atmosphere and warms it





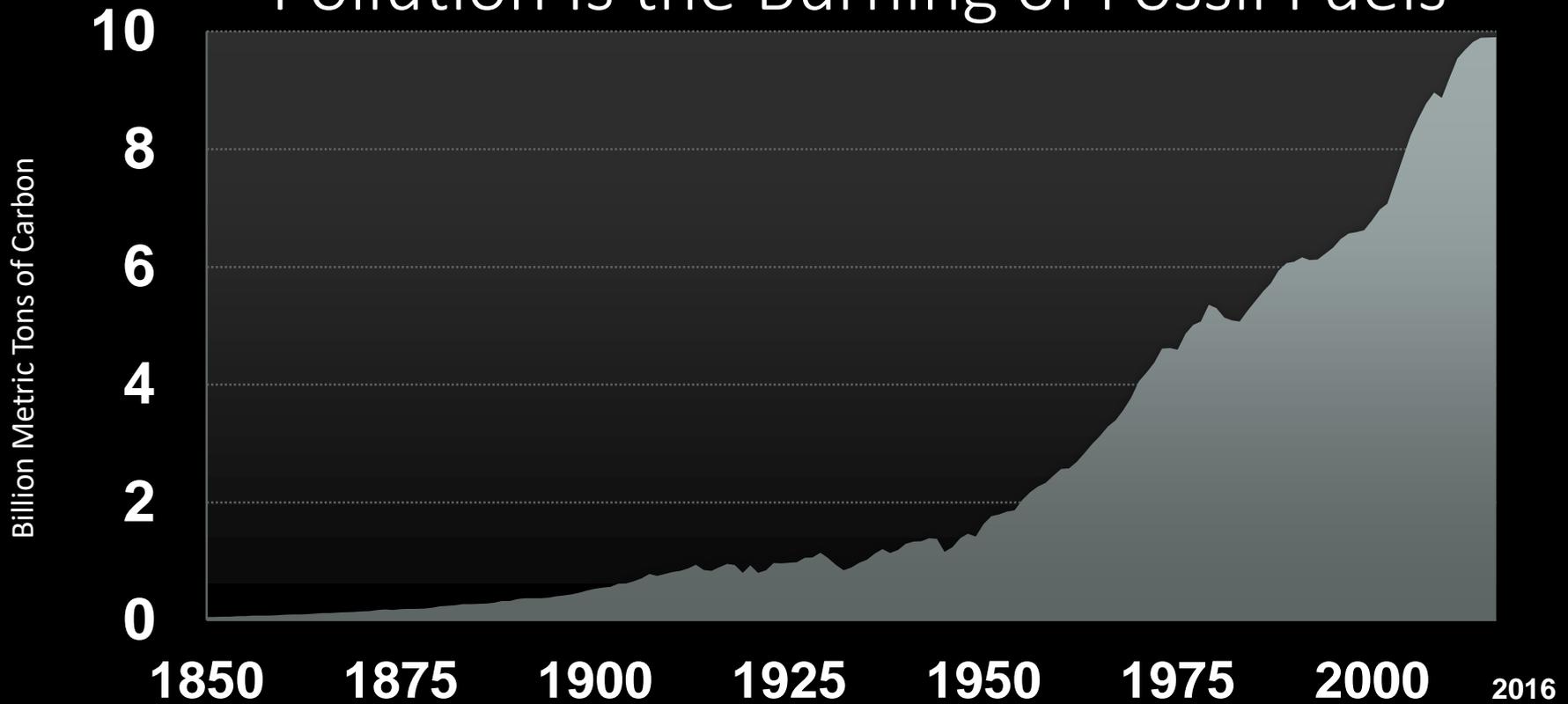
We are now spewing 110 million tons of manmade global warming pollution into the thin shell of our atmosphere every 24 hours, as if it were an open sewer.

CO<sub>2</sub> is being released  
into the atmosphere  
faster than at any time in  
at least the last  
66 million years.



As the CO<sub>2</sub> concentration increases, more of the outgoing infrared radiation is trapped.

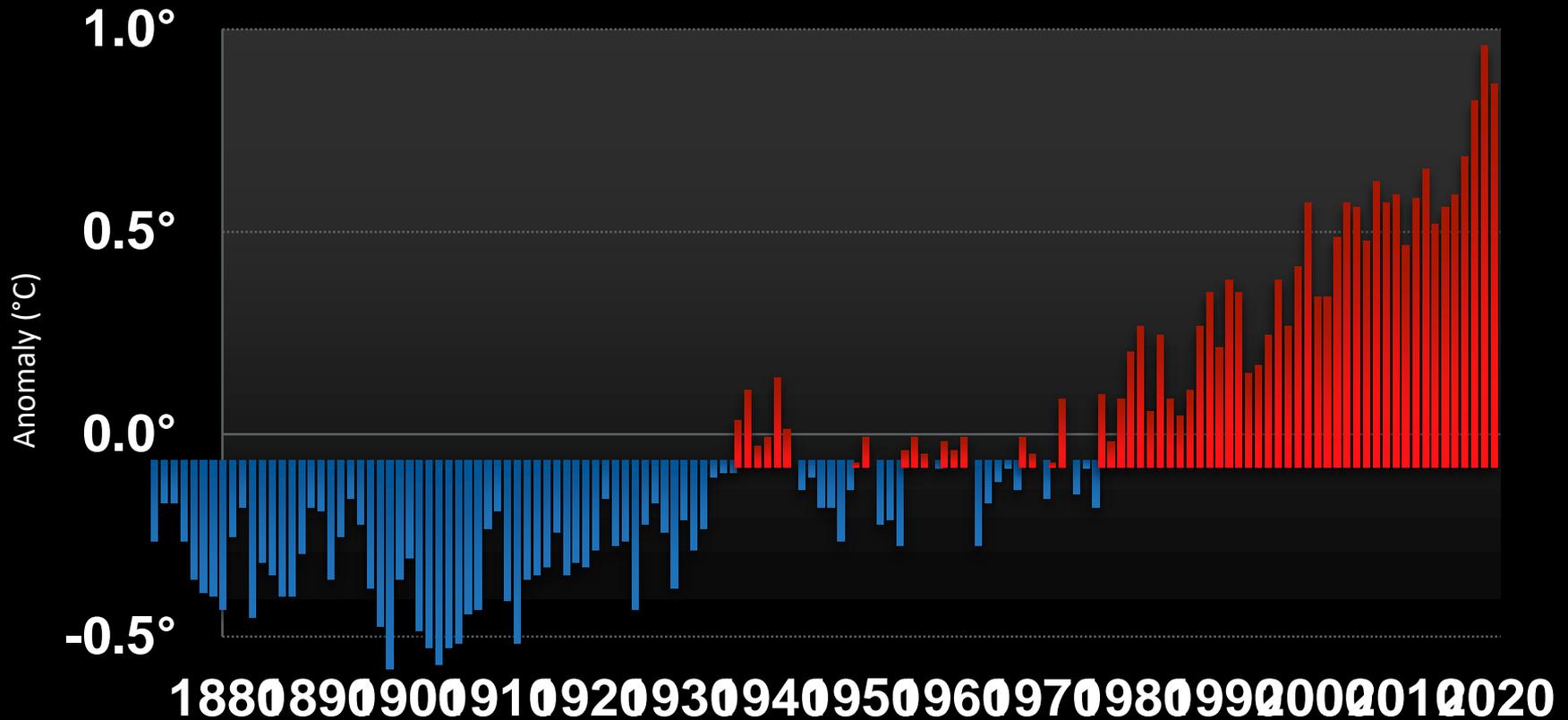
# The Largest Source of Global Warming Pollution Is the Burning of Fossil Fuels



Data: U.S. Department of Energy/CDIAC

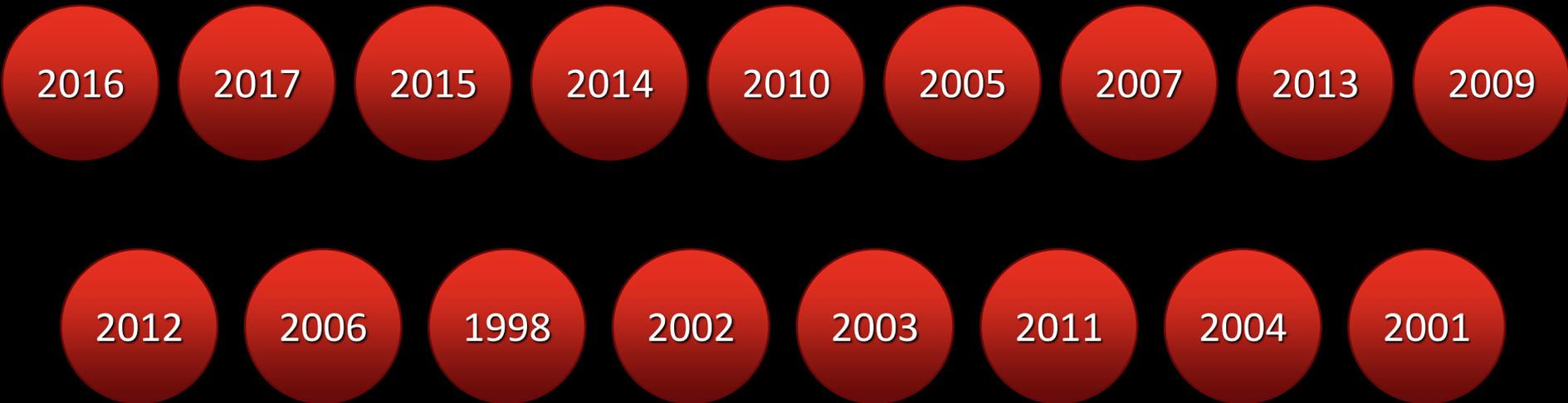
# Global Surface Temperature – Departure from Average

• 1880 – 2017



Data: NOAA

# 17 of the 18 Hottest Years Ever Recorded Have Occurred Since the Year 2001



Globally, floods and  
extreme rainfall events  
now occur  
four times more often  
than in 1980

# York, England

• April 4, 2018



# Volgograd Region, Russia

• April 4, 2018



Zhengzhou, China

• May 16, 2018



# Mogadishu, Somalia

• May 21, 2018



# Eiweiler, Germany

• June 11, 2018



# Salies-de-Béarn, France

• June 13, 2018



**Brut.**



Medical Emergency:  
Worldwide,  
air pollution kills  
7 million people  
every year

“Climate change is  
disrupting natural  
ecosystems  
in a way that is making  
life  
better for infectious  
diseases.”

• Andrew Dobson

Department of Ecology and Evolutionary Biology, Princeton University



Sea turtle sex is determined by temperature.

At the northern edge of Australia's Great Barrier Reef, 99% of young green sea turtles are now female.



**2. Can we change?**

**Yes, we have the  
solutions at  
hand!**

# Green Energy Progress

- How Do Projections Compare With Reality?

## 2000 Projection

Worldwide wind capacity will reach 30 GW by 2010

## Reality

By 2017 that goal was exceeded by a factor of

**18 x**

Globally, wind could supply  
worldwide electricity consumption  
40 times over

# Solar Energy Progress

- How Do Projections Compare With Reality?

## 2002 Projection

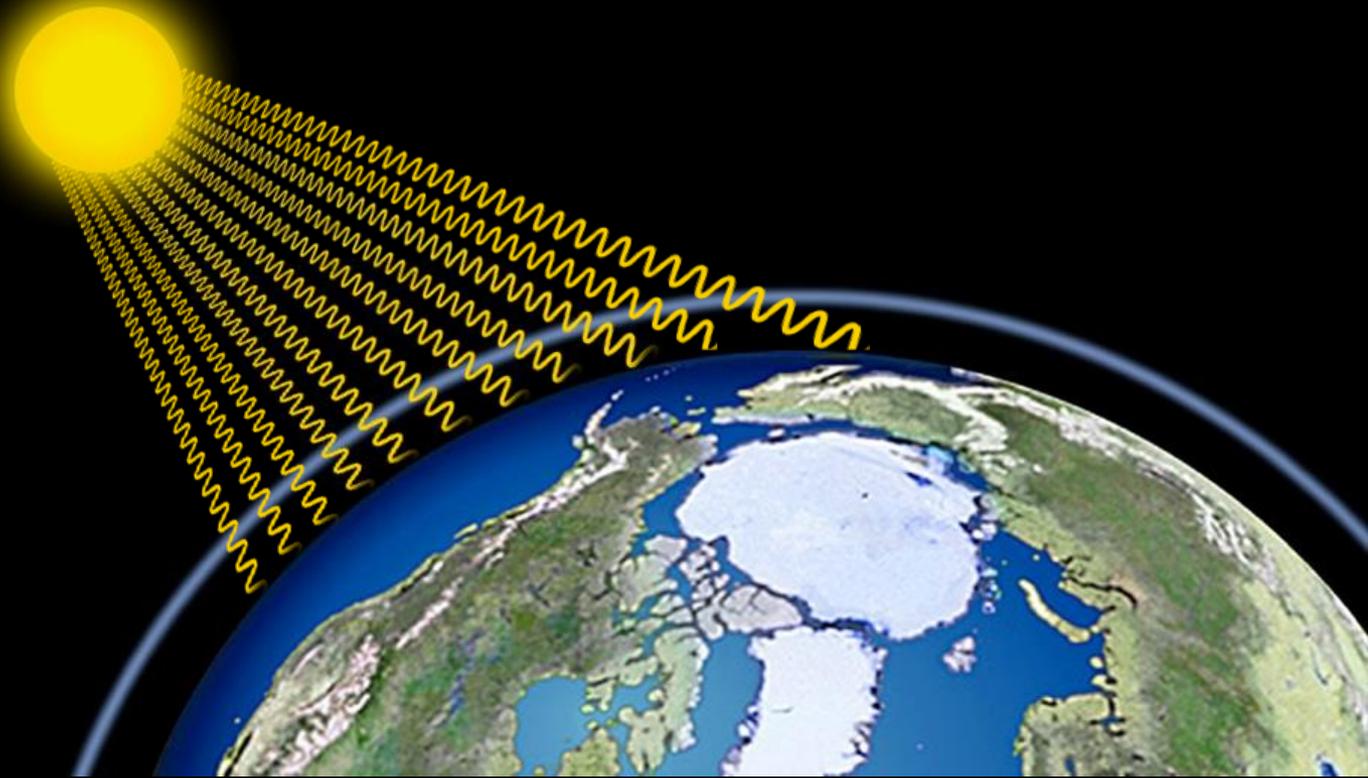
The solar energy market will grow one gigawatt per year by 2010

## Reality

The reality is that in 2017 it was exceeded by

**98 x**

Enough solar energy reaches Earth **every hour**  
to fill all the world's energy needs **for a full year**





Source: NASA

**3. Will we change?**







CLIMATE REALITY CAMPUS CORPS

# #OURMEATLESSJOURNEY

## TESTIMONIES

How did you cut down on meat? What would you have liked to know beforehand? How do you feel about it now? What challenges did you overcome? What assumptions proved to be wrong?

Share with us your meatless journey!





The Climate  
Reality Project

# 100% COMMITTED





# The Climate Reality Project<sup>®</sup>

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Conservation is hard



because keystone of sustained conservation is

**Behaviour**

Intention

≠

Action



This does not mean there is something wrong with us as humans, but it does mean that our understanding of human behaviour can be improved by appreciating how people systematically go wrong.

Richard Thaler (2017 Nobel Prize winner in Economics) and Cass Sunstein  
Nudge: Improving Decisions About Health, Wealth, and Happiness



principles



# Present bias

Benefits and costs in the present appear disproportionately larger relative to those in the future

# Implication

- | Smaller but sooner rewards are more attractive than larger later rewards
- | Reward behaviour immediately





# Inconsistent preferences

Our preferences are not fixed but change significantly over time, so we need help (commitment devices) to stick to our plans

# Implication

- | Make commitment public or shared
  - | Make it active
  - | Make it voluntary





# Reminders/Cues/Prompts

We have limited memory and attention. Soft nudges can have a big impact on our behaviour.



# Our project

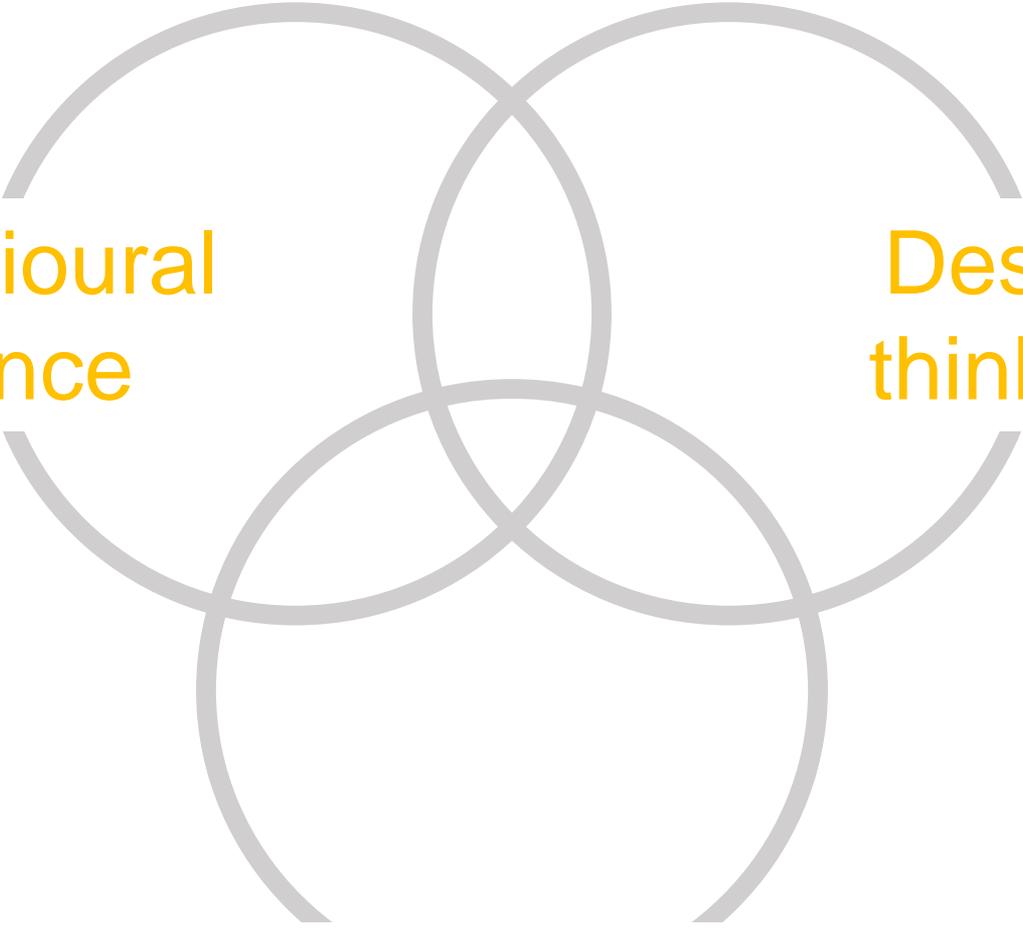


**NUDGEATHON**

BEHAVIOUR / INSIGHT / CHANGE



Going forward



Behavioural  
science

Design  
thinking

Tech

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**Panel**



Thursday October 18th – 6.15pm – Zeeman, MS01

# **WARWICK SUSTAINABILITY SUMMIT**

# Get Involved

[www.warwick.ac.uk/environment](http://www.warwick.ac.uk/environment)

Twitter: @WarwickUniSust

Facebook: @WarwickSustainability  
[sustainability@Warwick.ac.uk](mailto:sustainability@Warwick.ac.uk)

Join Green Champion network



<https://climathon.climate-kic.org/en/coventry>

Green Week 4<sup>th</sup> – 10<sup>th</sup> March 2019



Thursday October 18th – 6.15pm – Zeeman, MS01

# **WARWICK SUSTAINABILITY SUMMIT**