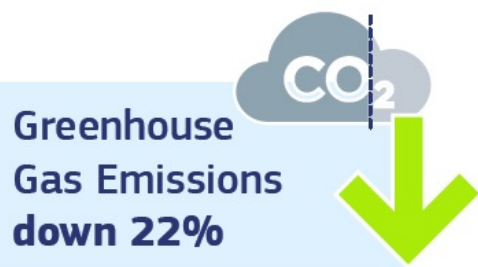


Socially beneficial offsetting

Jeremy Woods
Centre for Environmental Policy
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What is needed to accelerate the „green“ transition?

THE EU HAS SUCCESSFULLY DECOUPLED GREENHOUSE GAS EMISSIONS FROM ECONOMIC GROWTH



1990-2017

EU GDP up 58%

1990-2017

- Technological Innovation
- New visions for sustainable life styles, i.e. in cities!
- Avoiding Leakage and rebound effects?



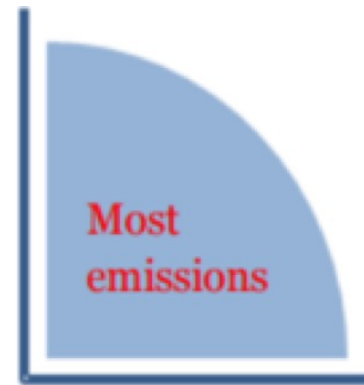
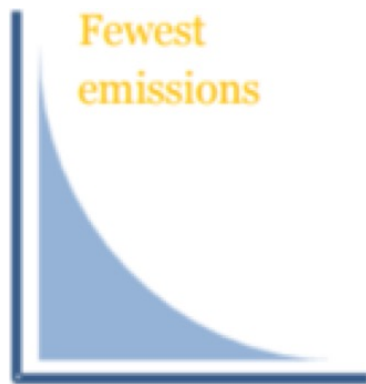
New Green Deal: Europe's „Man on the moon moment“

Ursula von der Leyen (EC President, 11/Dec/2019)

- 1 trillion € by 2030
- 2030 minus 50-55% GHG emissions
- Adopts a net-zero by 2050 approach

Net-zero framing

Different decarbonisation speeds would lead to different cumulative emissions and, hence, to different amounts of warming, even if net-zero is reached at the same time.



Note the difference between 'Net-zero' and 'neutrality':

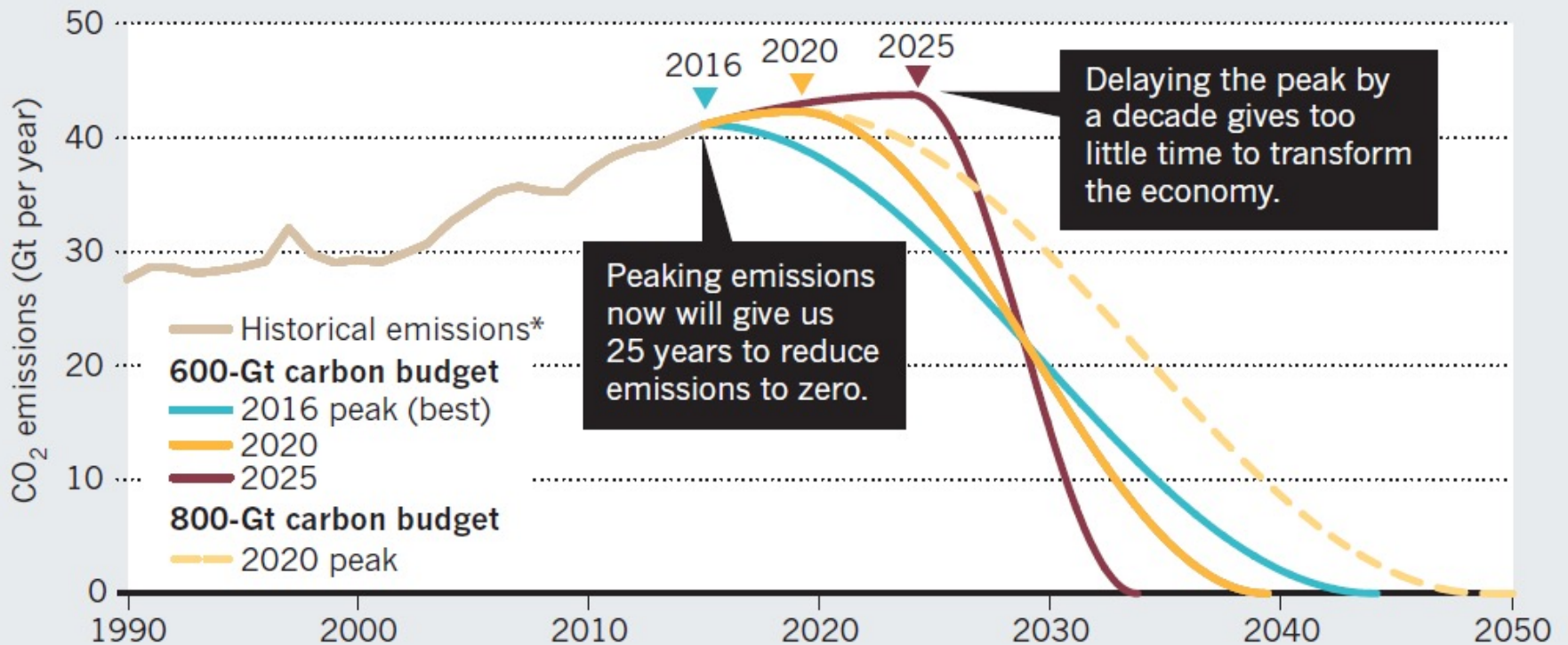
'**Net-zero**' requires both emissions reduction + enhanced sinks

'**Neutrality**' only requires that emissions are balanced by enhanced sinks. Is not a viable approach when applied at a global level

Timing of action - critical

CARBON CRUNCH

There is a mean budget of around 600 gigatonnes (Gt) of carbon dioxide left to emit before the planet warms dangerously, by more than 1.5–2°C. Stretching the budget to 800 Gt buys another 10 years, but at a greater risk of exceeding the temperature limit.



*Data from The Global Carbon Project.

Using the Global Carbon Budget in EUcalc

Best estimates of the Transient Climate Response to cumulative CO₂ Emissions (TCRE) from climate models and observational data, with corresponding estimates of the CO₂-only carbon budgets associated with a given amount of CO₂-induced global temperature increase. (Matthews et al, 2019)

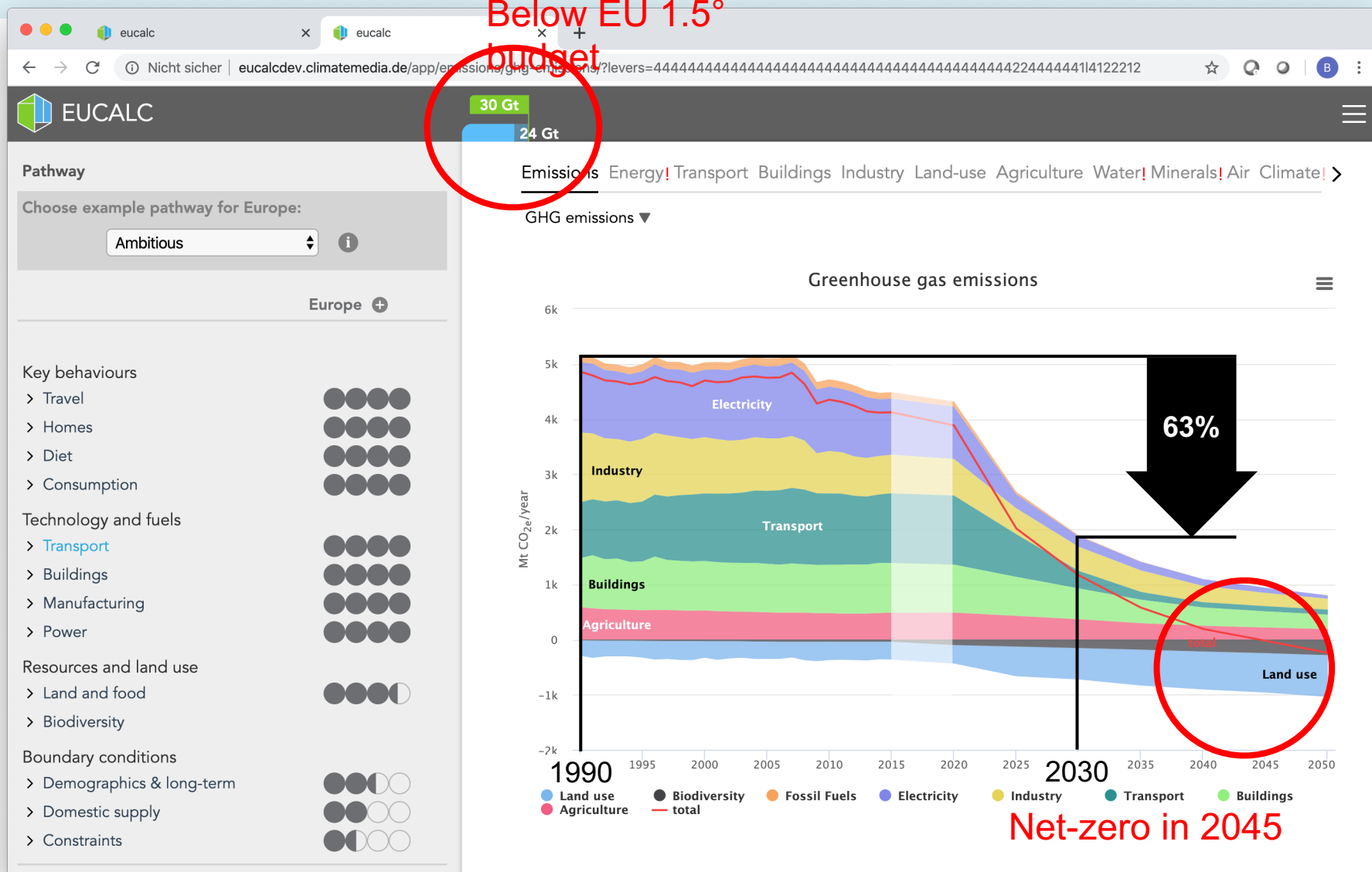
	TCRE	CO ₂ -only Carbon budgets		
		per °C	1.5 °C	2 °C
CMIP5 models	1.6 °C/1000 GtC (0.44 °C/1000 GtCO ₂)	625 GtC (2290 GtCO ₂)	940 GtC (3445 GtCO ₂)	1250 GtC (4585 GtCO ₂)
Observations	1.35 °C/1000 GtC (0.37 °C/1000 GtCO ₂)	740 GtC (2715 GtCO ₂)	1110 GtC (4070 GtCO ₂)	1480 GtC (5425 GtCO ₂)

Italicized values in parentheses are in units of CO₂ rather than C, where 1 tonne of C = 3.67 tonnes of CO₂, and all carbon budget values are rounded to the nearest 5 Gt. Matthews et al. 2017. Estimating Carbon Budgets for Ambitious Climate Targets (Carbon Cycle and Climate. Curr Clim Change Rep (2017) 3:69-77

- Climate effective transition pathways will combine emissions reduction & enhance carbon sinks –
- Bioenergy deployment needs to demonstrate both interventions together
- Bioenergy with carbon capture and storage (BECCS) deploys the capture of CO₂ and its storage in geological reservoirs
- BiogasDoneRight needs to enhance soil carbon stocks but can also be deployed with CCS

Ambitious pathway development (<http://tool.European-calculator.eu>)

Below EU 1.5°
budget



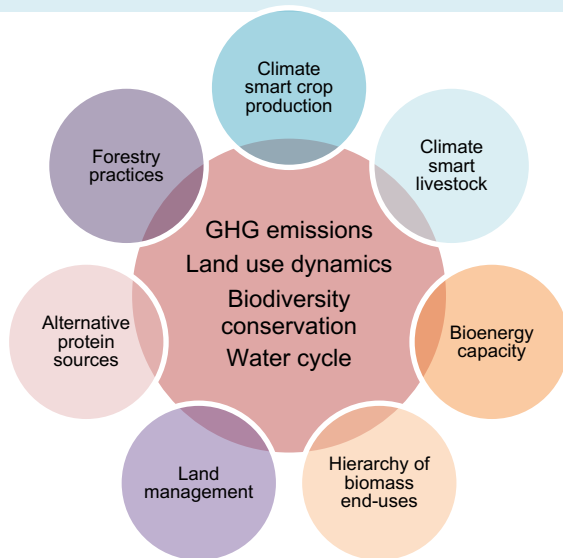


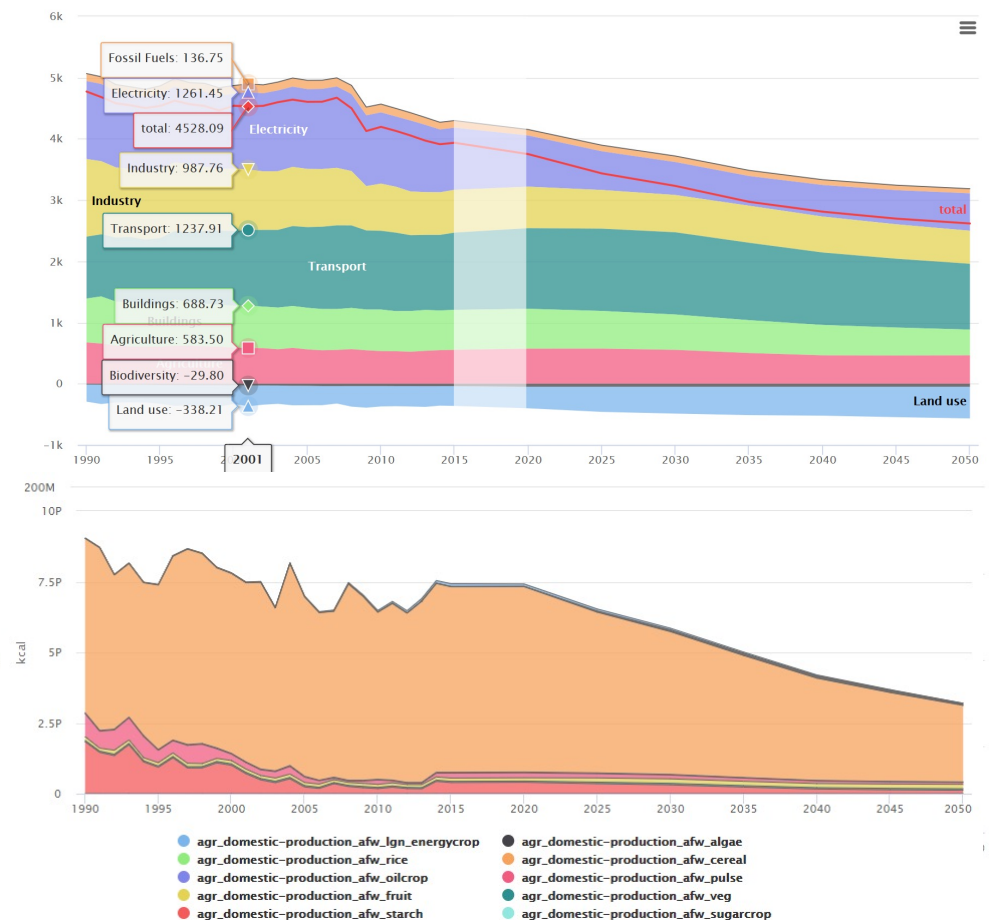
Figure 1: Agriculture and Land-Use Levers in the EUcalc

Warning!

Trade-offs and co-benefits and complex interactions are likely to result from changes to ANY and ALL of the 7 Land Use & Food Production levers

Emissions Energy Transport! Buildings Industry Land-use Agriculture Water Minerals! Air Climate! Jobs Costs !>

GHG emissions ▼





The offer to Mitigate Carbon Damage

Proof of concept stage:

- 2017 total CO₂ available to be traded:
 - 6000 trees = 3000 tonnes CO₂ (tCO₂) sequestered over 25 years ¹
 - = 120 tCO₂ available for purchase from carbon sequestered in 2017
 - @ £25/t CO₂ = £3,000
 - 10t CO₂ = £250 or 500 macadamia trees 'supported' each year
- 2018 estimated CO₂ available for offsetting:
 - 13,000 trees = 6,500 tCO₂
 - @£25/t CO₂ = £6,500 income to support smallholder farmers

Note:

¹ Conservatively assume 0.5 tCO₂ is sequestered by a macadamia tree over 25years

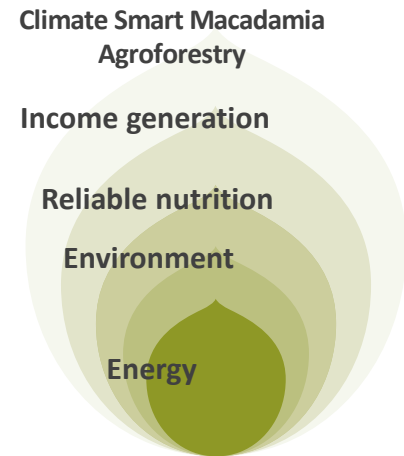
Climate Smart Macadamia
Agroforestry

Income generation

Reliable nutrition

Environment

Energy



How much does a tonne of carbon (CO₂) cost?

High variability within the market as the market is voluntary and the type of carbon reduction project varies:

- Project Type – cook stoves, avoiding deforestation, solar panels, industrial emissions efficiency, etc.
- Geography – cost of tree planting in Africa is cheaper than the UK
- Policy – UK and EU regulations create markets and tax carbon pollution through its EU Emissions Trading System (ETS) which dictate prices
- Business perspective – companies choose their own prices for internal modelling based on research and perceived future policies

	Price £/tCO ₂	Av. £ / farmer.yr *
Malawi average	£3.49	£2.73
Plan Vivo average	£5.97	£4.66
UK Climate Change Levy	£24.36	£19.10
EEA Costs of Air Pollution rpt (2014)	€9.5 to €38.1	
Climate Smart Macadamia	£25	£19.60
US EPA Social Cost of Carbon	£26.72 (inc. 3% p.a.)	£20.95
Statoil (Internal Price)	£44.15 (\$50)	£34.52

Average annual income per farmer – assumes typical farmer plants 196 trees

Average household income for HIMACUL/NMT macadamia farmers between US\$21 to 70 per mnth (2014/2015)

Thank You

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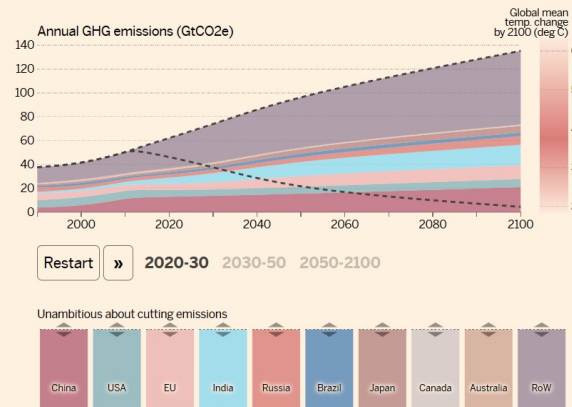
Dr Lorenzo Di Lucia (ILAMS)

**Prosperous living for
the world in 2050:**
insights from the
Global Calculator

FINANCIAL TIMES

Climate calculator

Use the sliders to set regional ambitions for emissions reduction, first for 2020-2030. Each slider's scope and impacts are unique, based on analysis of the region's capabilities by academics at Imperial College London. After setting yours, let's proceed to the next period...



<http://ig.ft.com/sites/climate-change-calculator/>

SCOPE

72

SCOPE • FAPESP • BIOEN • BIOTA • FAPESP CLIMATE CHANGE

Bioenergy & Sustainability: bridging the gaps

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<http://www.globalcalculator.org>

<http://www.european-calculator.eu>

<http://bioenfapesp.org/scopebioenergy/index.php>