Is the European Green Deal ambitious enough?

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- Project: A fiscally sustainable public investment initiative in Europe
- First output: **How to boost the European Green Deal's scale and ambition** (click here)
- Collaborative effort: FEPS, AK and Renner Institut
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Four core messages from climate science

(I) We need to reach (net) zero

- Relying on large scale negative emissions highly uncertain: net zero close to zero
- What is involved / where do current emissions come from:

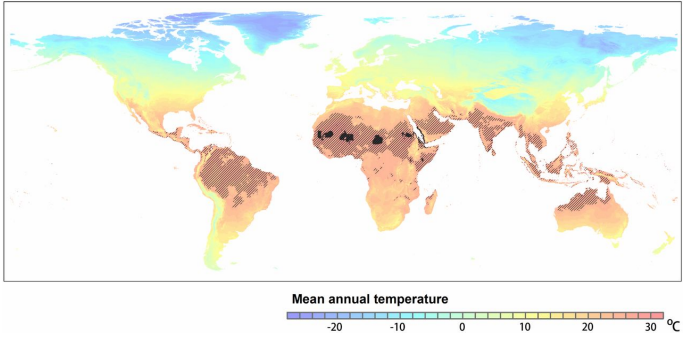
Table 1: Breakdown of EU27 greenhouse gas emissions.

1	Energy production	79%
1.1	Fuel combustion in energy industries	26%
1.2	Fuel combustion in road transport	19%
1.3	Fuel combustion by households	8%
1.4	Fuel combustion in manufacturing and construction	11%
1.5	Other Energy[A]	15%
2	Industrial processes and product use	8%
3	Agriculture	10%
4	Waste management	3%
		100%

Source: Eurostat [env_air_gge] and European Environment Agency. Excluding land use, land use change and forestry and biomass. A: Other Energy includes all other items under energy including international aviation and shipping.

(II) Price of inaction is probably higher than we think

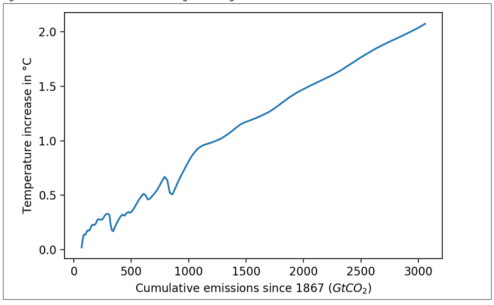
- Consequences of inaction (EEA, 2017): droughts, heatwaves, storms and floods
- Doing nothing will make world much less suitable for human habitation
- In 2070 3.5 billion people could life in regions with MAT's $> 29°C$ (Xu et al., 2020)



(IIIa) There is not much time left

- linear relationship between cumulative CO_2 emissions and global temperatures

Figure 2: Cumulative emissions and average warming.



Based on data from IPCC RCP 8.5 scenario (Meinshausen et al, 2011) simulated with FAIR 1.3 model (Smith et al, 2018).

- limiting global temperatures to 1.5° above pre-industrial levels requires limiting amount of CO_2 in atmosphere: **carbon budget**

- Why 1.5°C? → tipping points and the principle of accelerating risk

(IIIb) There is not much time left

- Global carbon budget estimates for 1.5°C target
  - Annual global emissions 2018: 42 $GtCO_2$
  - from 2020: 349 $GtCO_2$ (66% chance to stay below 1.5°C) (IPCC, 2018, p. 108)
  - from 2020: 235 $GtCO_2$ (66% chance to stay below 1.5°C) (Constrain, 2019)
  - 5-8 years left at current rates
- EU27 carbon budget estimates for 1.5°C target
  - Annual EU27 emissions 2018: 3 $GtCO_2$
  - from 2020: between 21 and 27 $GtCO_2$ (66% chance to stay below 1.5°C) (Anderson, John, & Stoddard, 2020):
  - at current rate: 7-9 years before we use up that budget

(IV) We (mostly) know what to do: required policies

- **Energy production**: Strategic goals: 1) de-carbonise energy production 2) electrification of energy carriers
- **Buildings**: Strategic goals: 1) deep renovations for increased efficiency 2) clean on site energy production
- **Transport**: Strategic goals: 1) expand public transport (int. highspeed rail) 2) electrify
- **Industry**: Strategic goals: 1) electrify, 2) increase efficiency and reduce material consumption

The European Green Deal (EGD)

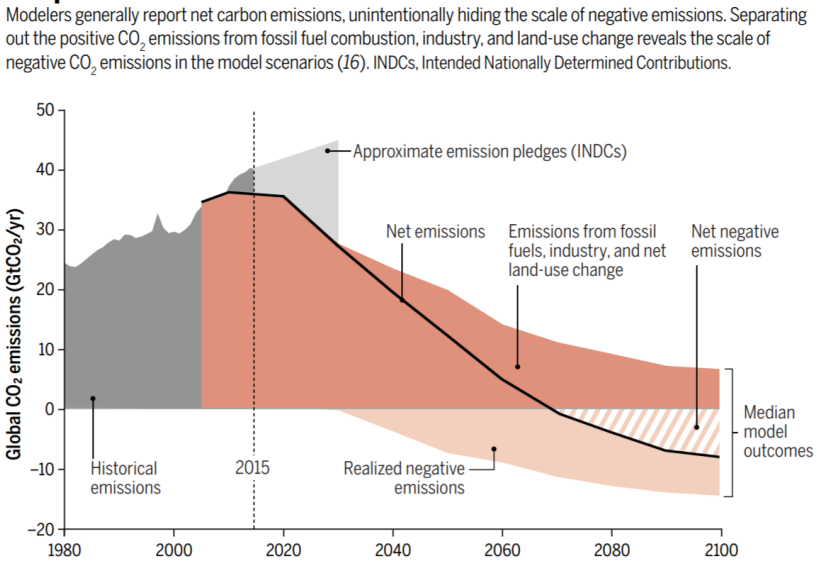
Old, new and necessary targets

Table 2: The EU's main climate targets

Targets for 2030	**Clean Planet for All (2018)**	**European Green Deal (2020)**	**Scientific Literature**
Cut in greenhouse gas emissions (1990 levels)	-40%	-50% to -55%	-65%[A]
Share of renewables in energy production	32%	32%	72%[B]
Improvements in energy efficiency	32.5%	32.5%	

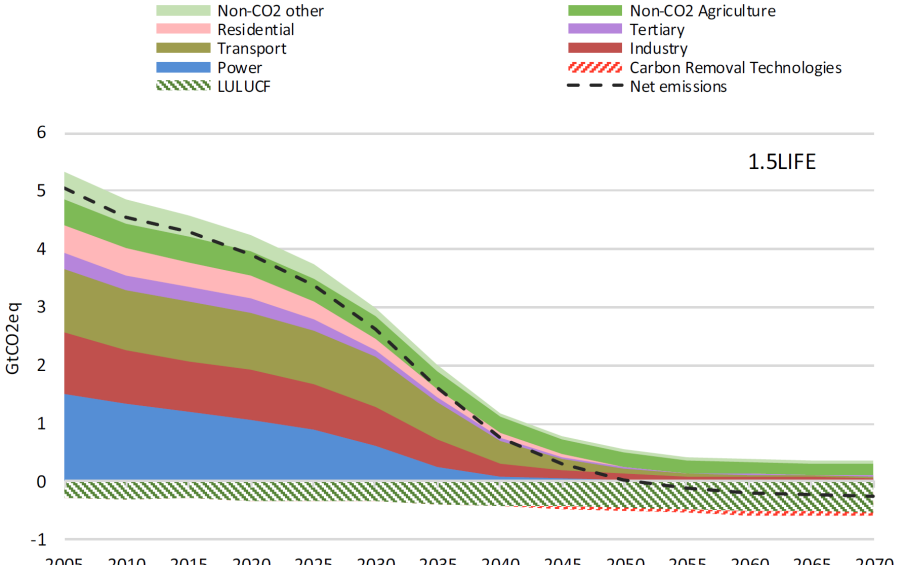
A: Anderson and Stoddard (2020) argue that a 75% reduction is necessary for energy CO2 emissions only. The underlying carbon budget of at most 27 GtCO2 is also consistent with Constrain (2019). Greenpeace argues that at least 65% percent reduction is required to achieve net zero emissions by 2040. B: Anderson and Stoddard (2020) argue for zero carbon energy production between 2035 and 2040. The EU27's share of renewables in energy production was 19% in 2017. Simply assuming a linear increase of 4 percentage points annually leads to a renewable share of 72% in 2030.

Where does the difference come from?



Source: Anderson and Peters (2016)

Where does the difference come from?



Source: EC (2018), Figure 90

Investment needs

The commission's estimates in context

Table 3: EU27 investment expenditure and investment gap estimates

source	business as usual scenario	1.5°C scenario estimate billion €	investment gap
European Commission - total investment[A]	1,190	1,480	290
European Commission - excl. transport investment[A]	377	576	199
Authors' calculations - excl. transport investment[B]	824	1,679	855

The European Commission investment figures are based on the PRIMES model suit (EC 2018b, Table 10) which are referred to in the EGD documents. The business as usual column refers to the baseline scenario used in EC (2018b) and consists mainly of pre-2015 policies and initiatives. The authors' business as usual scenario is based on recent historical investment expenditures. The 1.5°C scenario column contains the estimated investment expenditures, necessary to limit global warming to 1.5°C (1.5TECH scenario in the case of EC/PRIMES). The investment gap is the difference between business as usual and 1.5°C scenario. For a detailed breakdown see Table 8 the Appendix and the following sections. A: Expenditures for the 2031-2050 horizon in 2013 prices. B: Expenditures in current prices.

Investment in Buildings

- European Commission (EC, 2018) for **buildings renovation**:
  - baseline scenario investments of € 253 bn
  - 1.5C scenario investments of € 302 bn
  - investment gap of € 49 bn
- Compare that to survey-based estimates of **buildings renovation costs** (EC, 2019):
  - current policies investments € 245 bn
  - trippling required to meet 1.5C: € 735 bn.
  - investment gap of € 490 bn.

Investment in Research and Development

- EGD estimates do not include R&D expenditures
- Compare to 3% or 4% of GDP target for R&D expenditures from Europe 2020 strategy
  - current EU27 R&D investments € 302 bn
  - 3% R&D investment gap: € 75 bn
  - 4% R&D investment gap: € 201 bn

Investment in Electricity Sector

European Commission (EC, 2018): € 80 bn for power plants and 32 bn for grid

Table 4: Non-R&D capital formation in the electricity sector.

	2015	**2016**	**2017**	**average**
gross value of non-R&D capital stock	1,649	1,671	1,725	1,682
gross non-R&D capital formation	67	67	66	67
gross non-R&D capital formation relative to stock	4.1%	4.0%	3.8%	4.0%
additional 5% stock replacement	82	84	86	84
additional 10% stock replacement	165	167	173	168

Electricity sector defined as section D of NACE Rev. 2. All figures in billion Euros, current prices. Data: Eurostat (nama_10_nfa_st and nama_10_nfa_fl). Based on data for 18 EU member countries. EU 27 excluding Bulgaria, Croatia, Cyprus, Denmark, Ireland, Latvia, Malta, Spain and Sweden due to data availability.

Investment in Industrial Processes

European Commission (EC, 2018): € 17 bn in industrial sector

Table 7: Core capital formation in manufacturing and mining sector (NACE B and C).

	2015	**2016**	**2017**	**average**
gross value of core capital stock	2,613	2,641	2,713	2,656
gross core capital formation	202	208	221	210
gross core capital formation relative to stock	7.7%	7.9%	8.2%	7.9%
additional 3% stock replacement	78	79	81	80

Values in billion Euros, current prices. Core capital formation is defined as all capital expenditures minus those on buildings (dwellings and structures) and minus R&D expenditures. Data source: Eurostat (nama_10_nfa_st and nama_10_nfa_fl). Based on data for 18 EU member countries. EU 27 excluding Bulgaria, Croatia, Cyprus, Denmark, Ireland, Latvia, Malta, Spain and Sweden due to data availability.

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Recent Developments

Next Generation EU

- COVID-19 stimulus programme: Next Generation EU
- EU-Commission plans to borrow € 750 billion on capital markets (5.4% of EU27 GDP) ...
- and hand out as grants and loans to member states
- Part of that spent on EGD projects

  → Positive development, no silver bullet

Conclusion and Policy Recommendations

Conclusion

1. The good news: a lot of the required technologies already exist
   - Big exception to that is many industrial processes
2. EGD: climate change on top of EU policy agenda
3. EGD: more ambition needed

Policy Recommendations: Increasing scale and ambition along four key dimensions

1. Decarbonise the energy system by 2035-2040.
2. Refrain from relying on large scale negative emission scenarios.
3. Scale up the investment target to match total required expenditures.
4. Use individual transfer payments and training grants to address the regressive nature of rising energy costs.

Policy Recommendations: Steps to reach these ambitious targets

5 Increase fiscal room via new revenue sources and reformed European fiscal framework.

6 Upgrade Sustainable Europe Investment Plan into a comprehensive climate master plan.

7 Implement and expand a carbon border adjustment mechanism.

8 Align the ETS with general emission targets and establish a price floor and inflation target.

9 Focus on providing stable finance for companies and refrain from encouraging further household sector borrowing.

10 Work with the European Research Council to establish a group of Europe-specific climate models published in an open source format.

Thank you!

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Download the report: here

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