

Long-term assessment of greenhouse gas emissions in Austria

The methane problem will be solved! What about the others?

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Similarities: Norway – Austria

- Well developed
- High GHG-emission
- High renewable
- Much grassland
- Much ruminants

= **Comperative advantages**

Long-term assessment of greenhouse gas emissions in Austria

Country		Norway	Austria
The people			
Residents	Million	5.4	8.9
Human Development Index	[0,1]	0.957	0.922
Energy sources			
Hydro power	TWh/year	133	73
Other	TWh/year	high potential, low exploitation	
Fossil energy		+++	-
Total Emission to air CO₂e₁₀₀			
Total	Million t	49.1	79.8
	t per person	9.1	8.9
top 20 emitters			
Agriculture	Million t	4.6	7.1
	%	9.3	8.9
Data to Agriculture CRF Sector 3			
Landuse in agriculture			
	Temporay or permantent grassland ha	740,000	993,000
	Cropland for feed production ha	135,000	242,000
	Cropland for food/other production ha	201,942	1,079,000
Ruminants			
	Cattle	800,000	1,900,000
	Cows	229,000	528,000
	Suckler cows	75,000	190,000
	Sheep	911,000	393,000

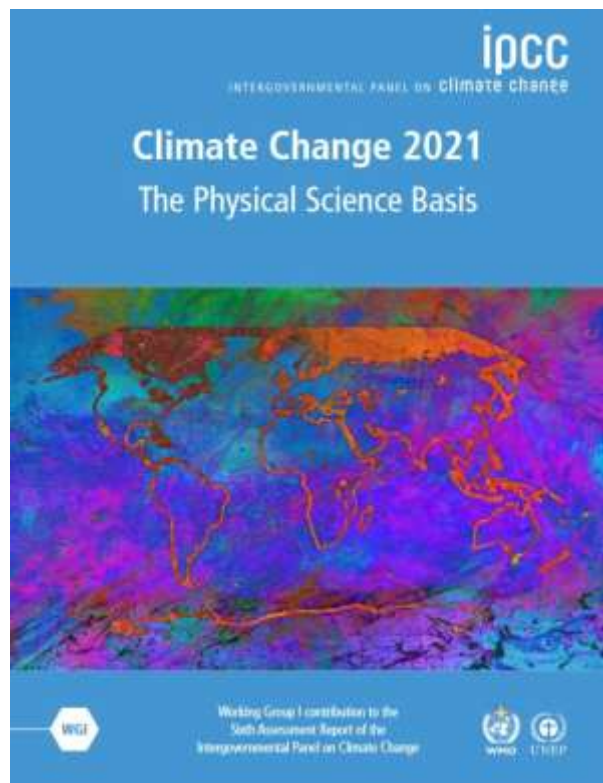
Cognition: The current discussion at GHG in Austria does not solve future problems.



1 : 1

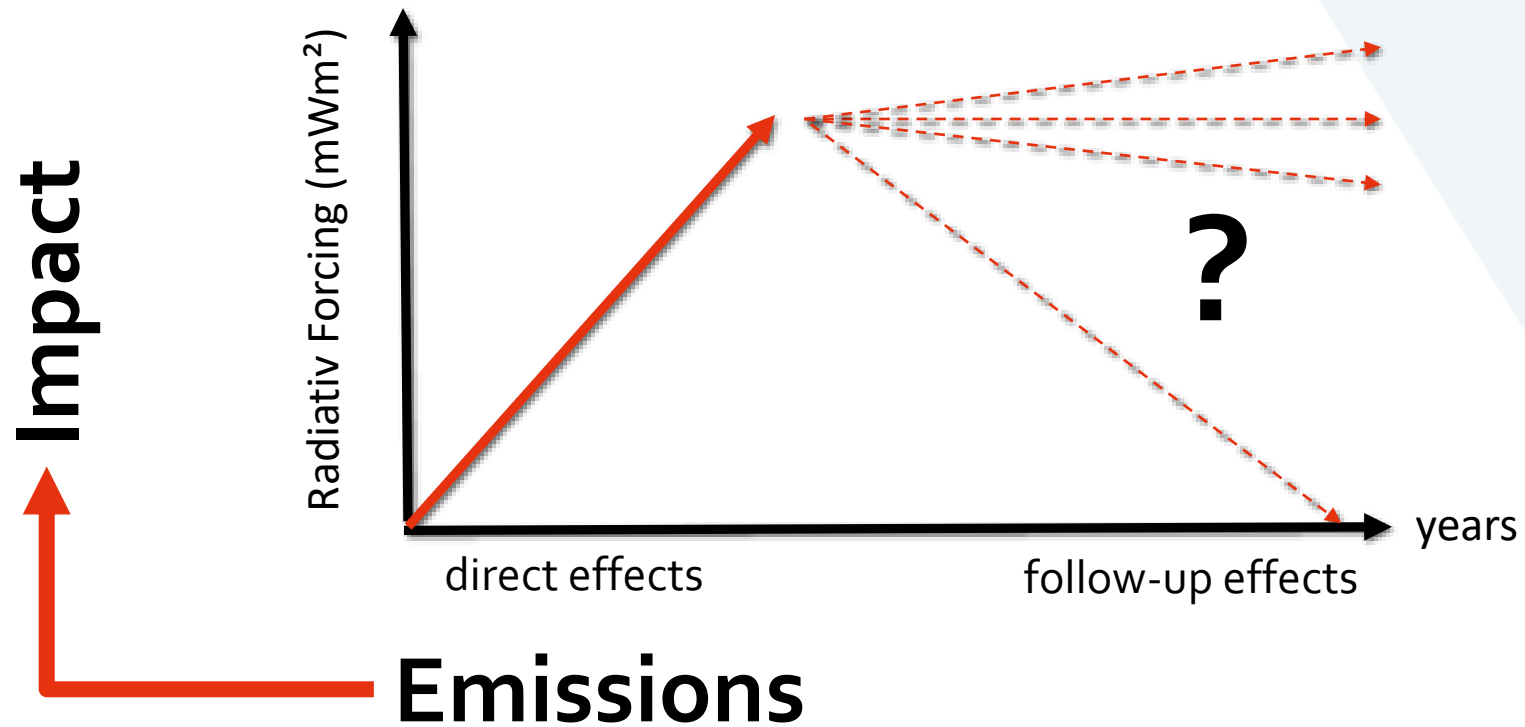
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Our goal: Downscaling the global GHG calculation to the national level because ...

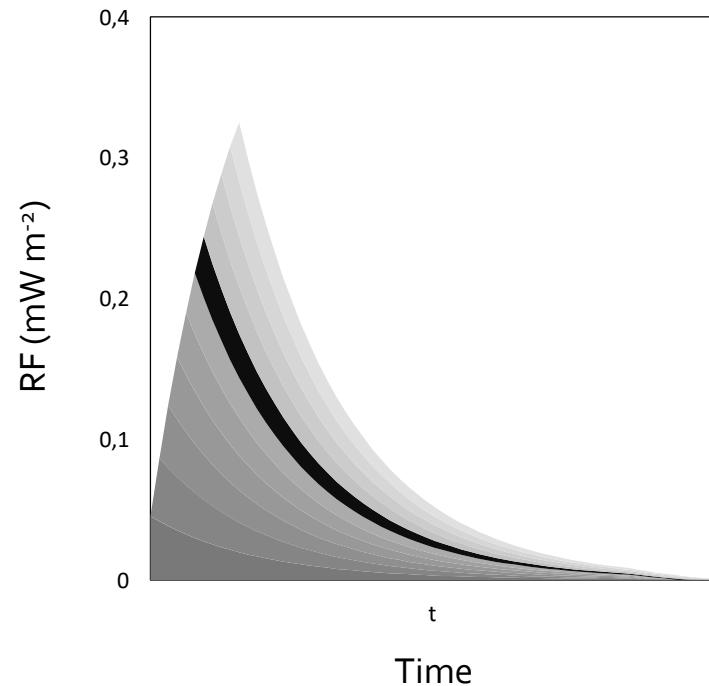


- ... some global aspects over-/underestimate the local situation.
- ... this leads to a weak development strategy.

... it was time to get a full (cradle to grave) picture.



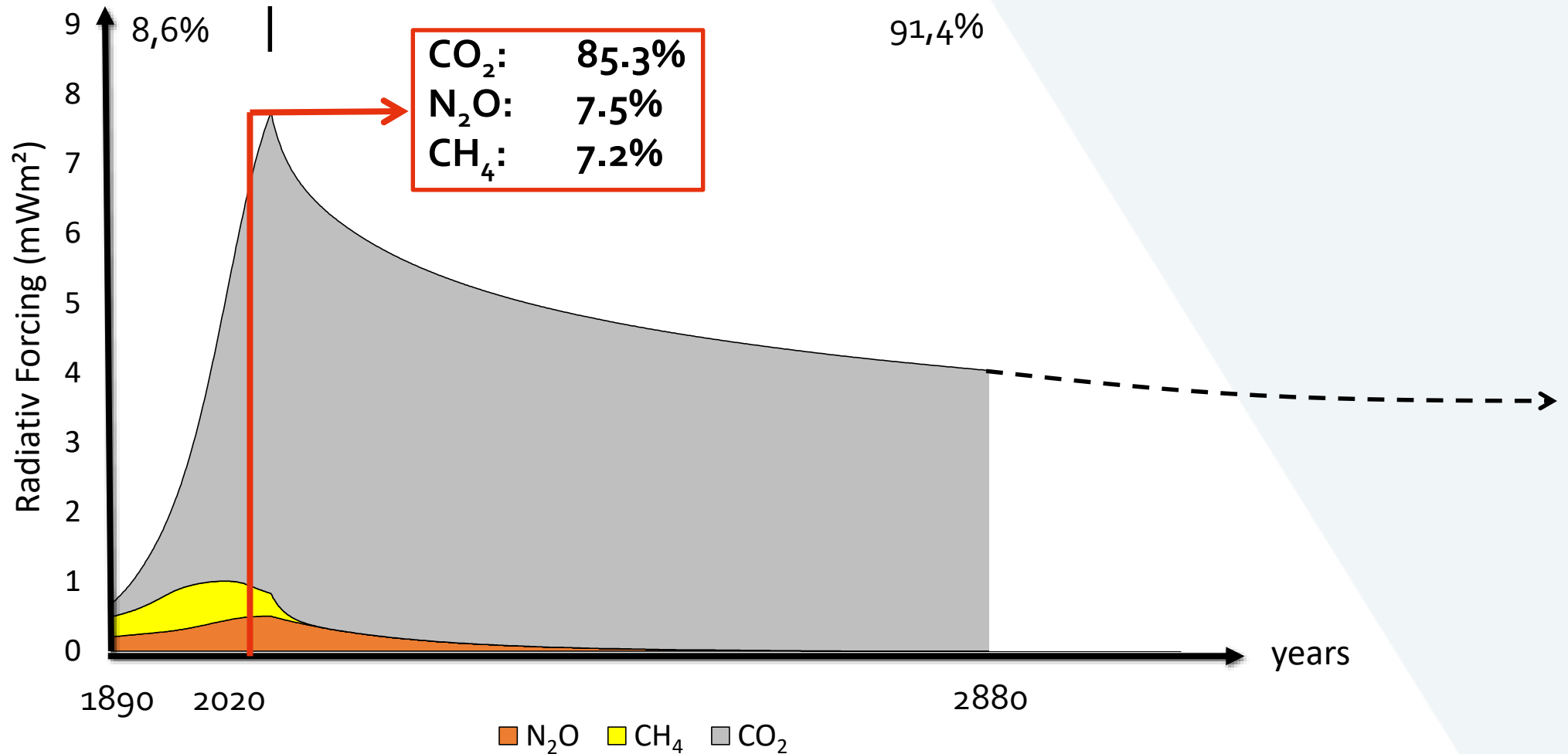
What happens at and after the time of emission?



The overall effect of GHG-Emission depends on

1. the amount of emissions over time
2. the individual degradation path of GHG's
3. the radiative forcing power of GHG's

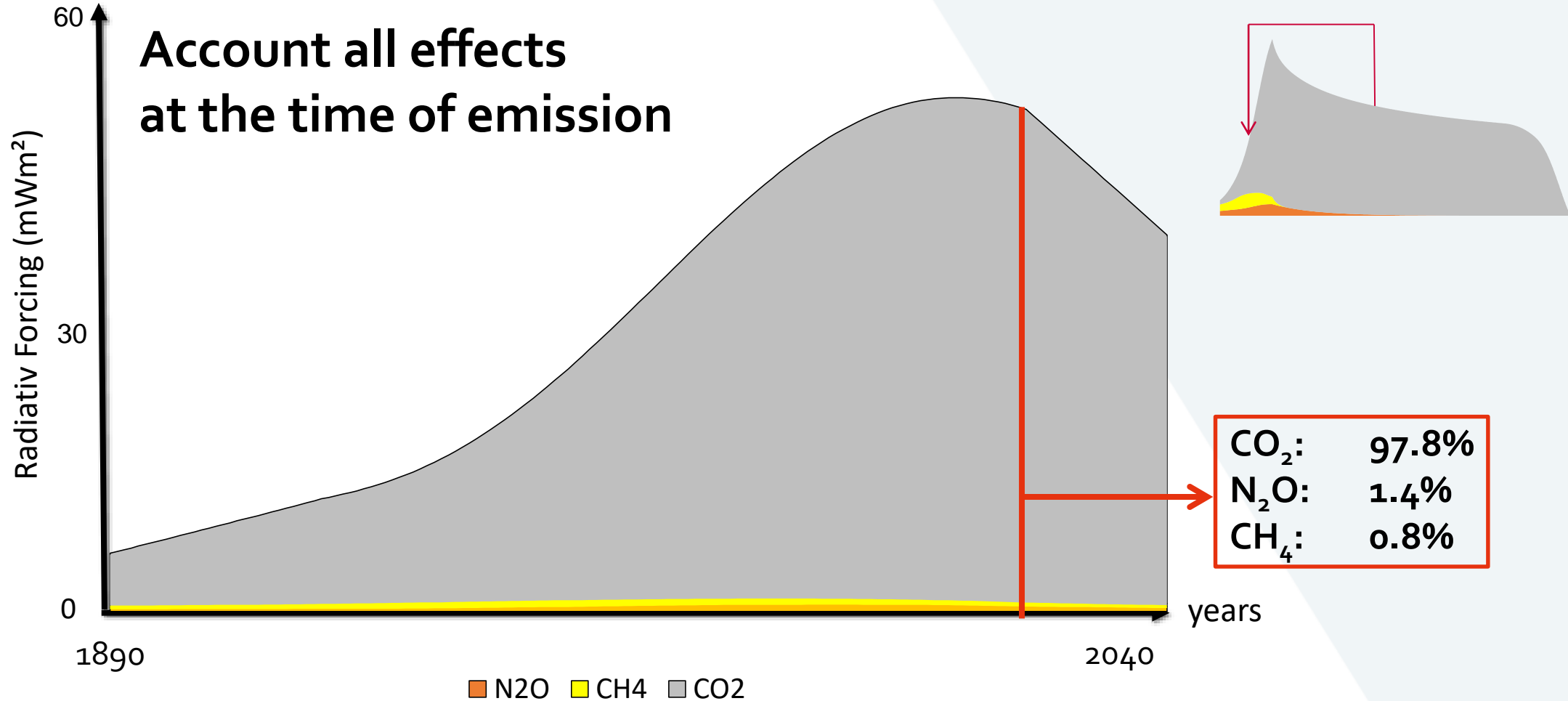
The results: Picture I = The long periode impact wave → This will happen!



Global warming is like a Tsunami: A future on a higher temperature-level



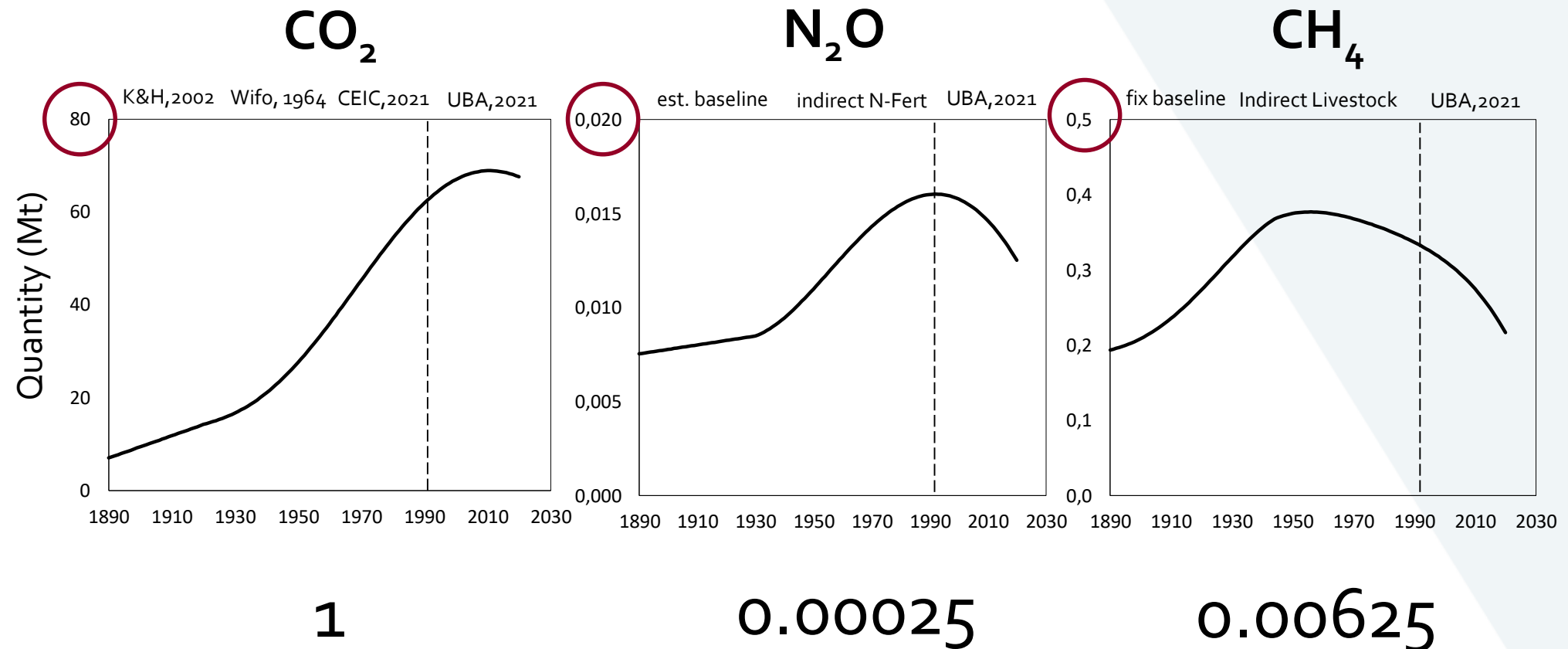
The results: Picture II = The triggering impact wave → Our responsibility!



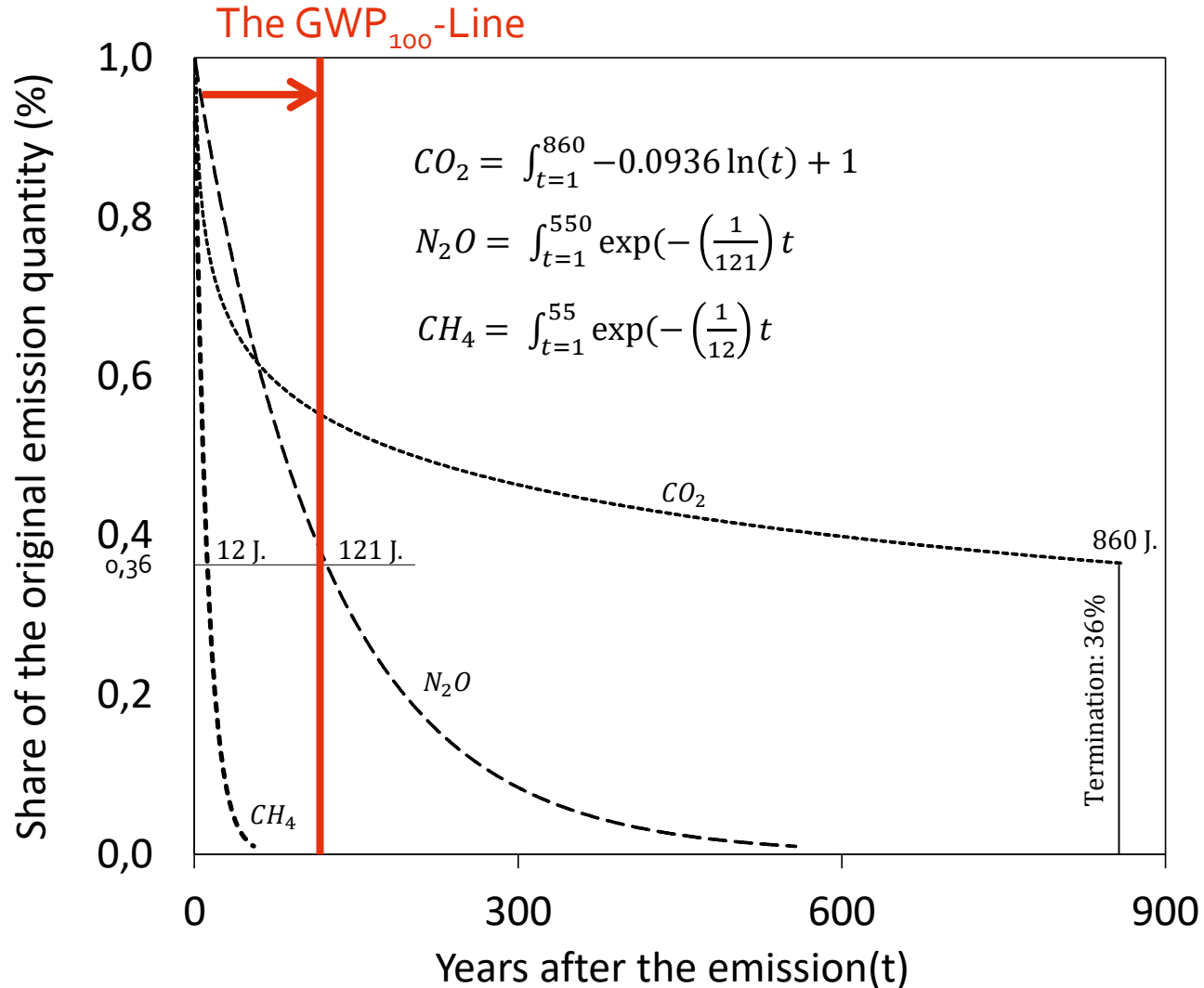
Going deeper inside: The effects

$$\mathbf{RF_t = \text{Emission quantity}_{MT} \times \text{degradation effect}_{\%} \times \text{radiative efficiency}_{mWm^2/MT}}$$

Knowledge I: The historical emissions pathways in Austria

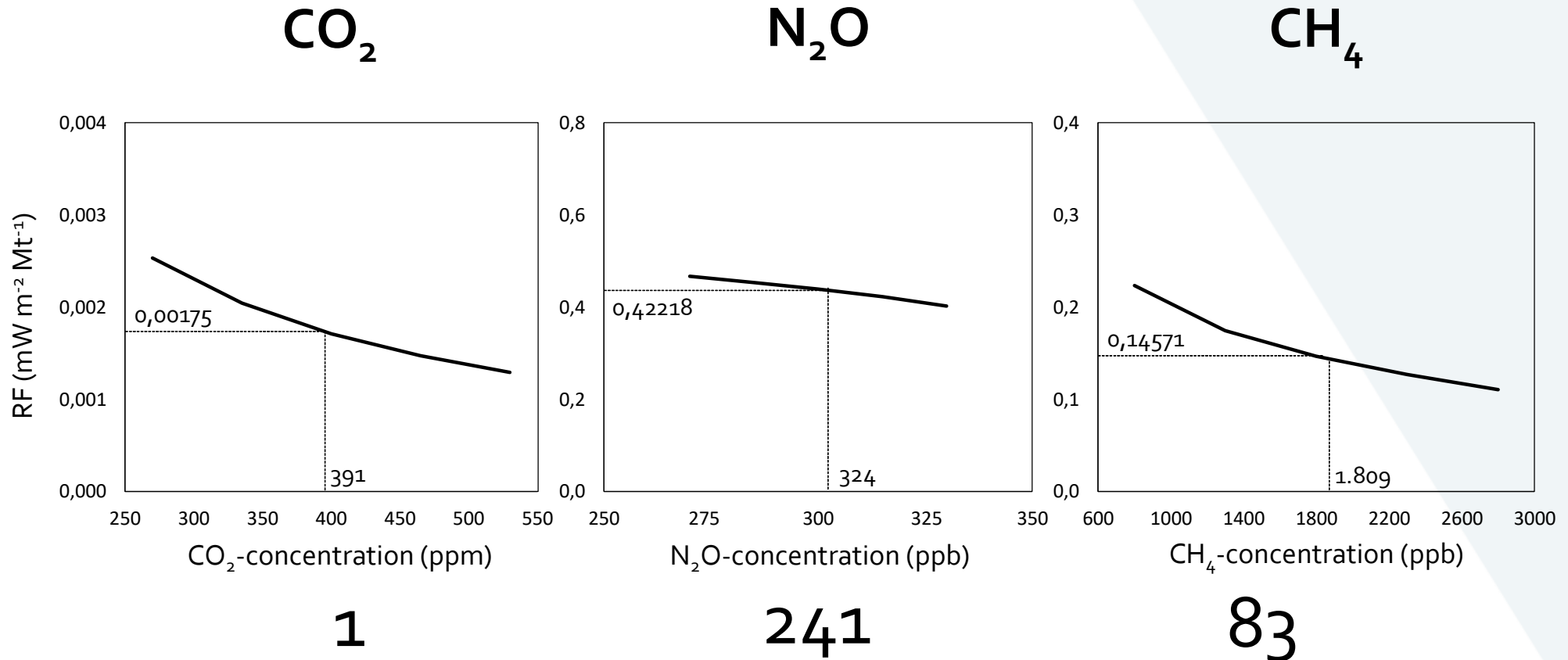


Knowledge II: The degradation pathway of one unit of emission



$CO_2 : 1$
 $N_2O : 0.3$
 $CH_4 : 0.029$

Knowledge III: The radiative efficiency



Going deeper inside: The effects

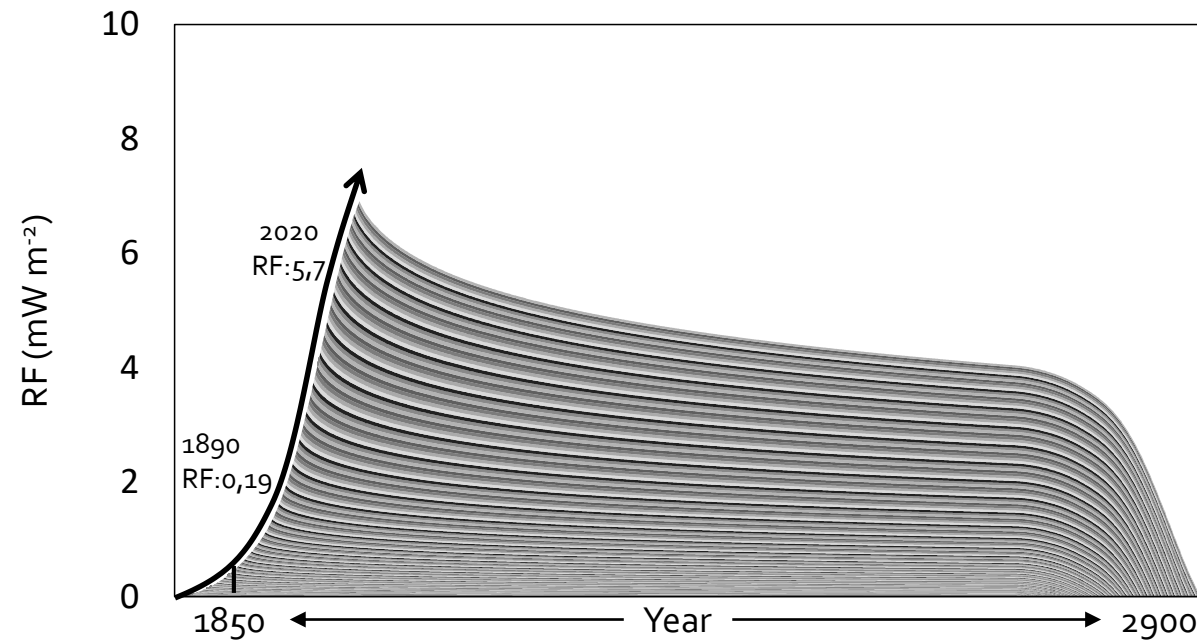
$$RF_t = \text{Emission quantity}_{MT} \times \text{degradation effect}_{\%} \times \text{radiative efficiency}_{mWm^2/MT}$$

		CO ₂	Ratio	N ₂ O	CH ₄
Emission quantity	MT	1		0,00025	0,00625
Degradation effect [1,860]	%	1		0,3	0,029
Radiative efficiency	mWm ² /MT	1		241	83

The difference of short-lived GHG to CO₂ is so large that a common assessment is always misused for differentiation. My recommendation: **Split the analysis and set own future targets.**

Comparable to GTP₅₀₀

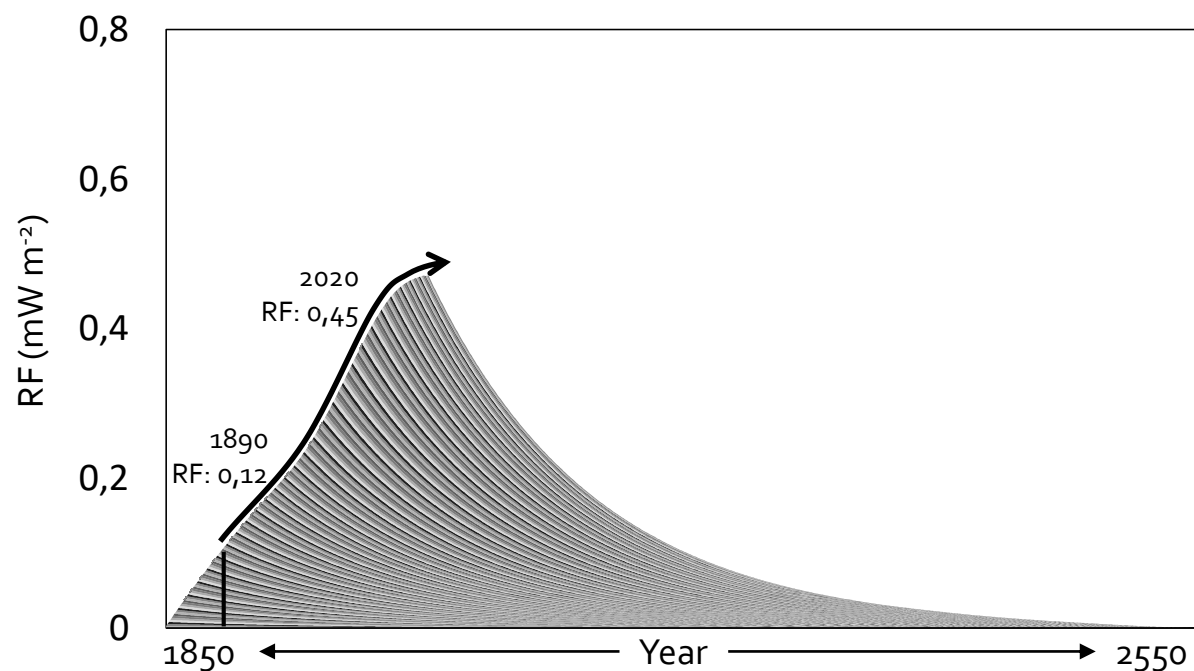
The single impact wave and its interpretation: CO₂



Impact wave CO₂

- strong in aggregation
- long effective duration
- dramatic RF (quantity driven)
- punishment forever

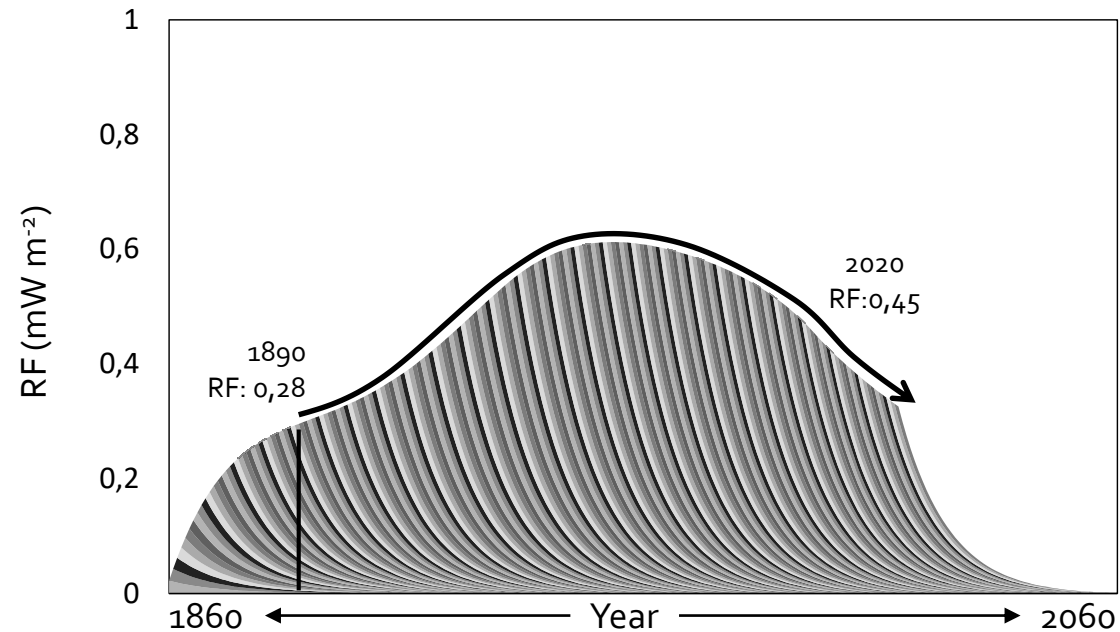
The impact wave and its interpretation: N₂O



Impact wave N₂O

- remarkable in aggregation
- media effective duration
- recognisable RF (quantity/quality)
- punishment for generations

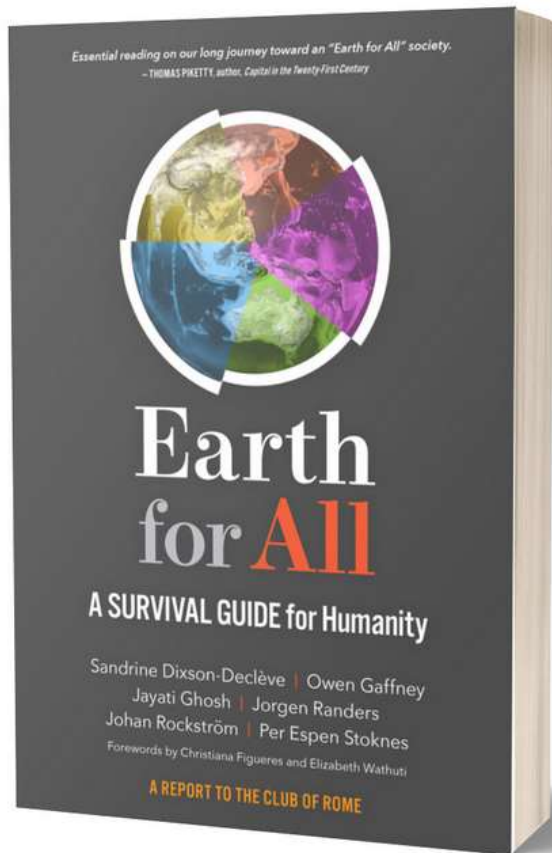
The impact wave and its interpretation: CH₄



Impact wave CH₄

- low aggregation
- low effective duration
- recognisable RF (quantity/quality)
- Net-Zero-Situation

What do we need to do urgently?



Scenarios

„To little-
to late“

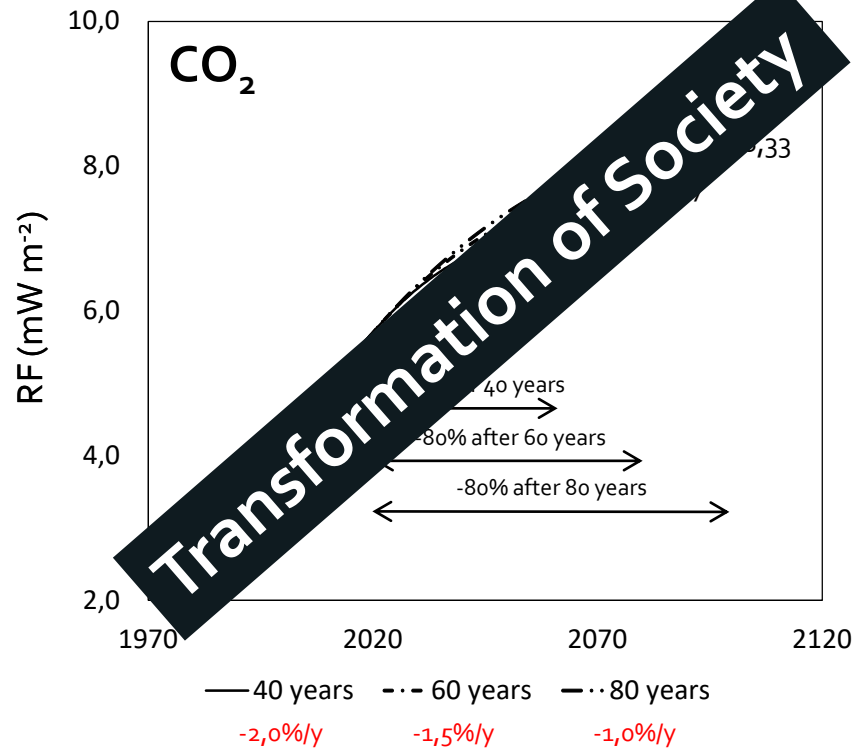
Collapse of the economy
very high warming

„Giant
Leap“

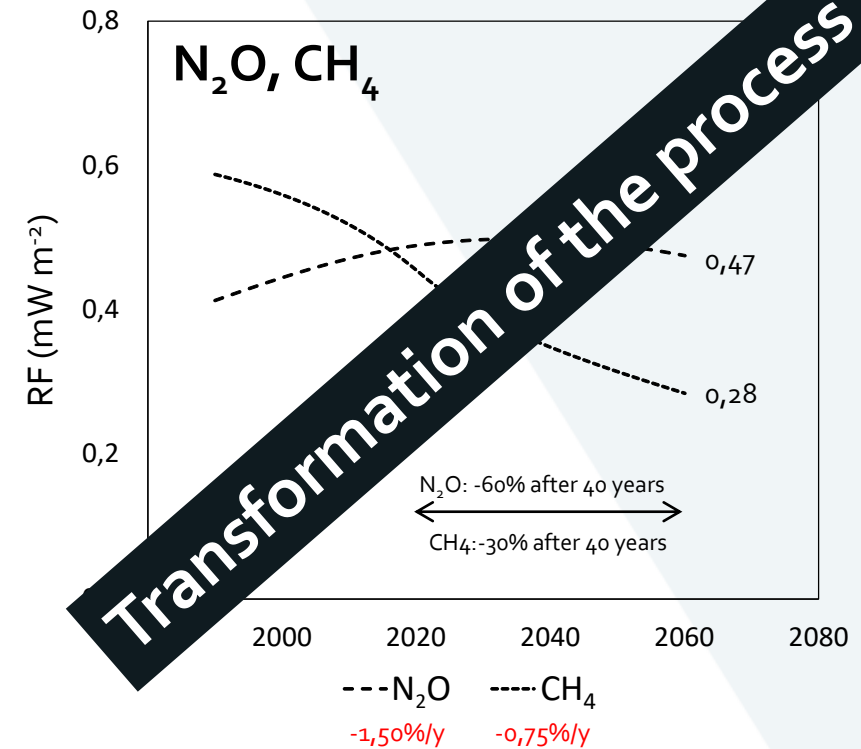
Renewable economy,
high warming

Possible pathways for Austria

Pathways to stabilisation of radiative forcing in the year 2060



The success of an implementation path is not imaginable



The path is defined and implementable!

My recommendations

- Do the „Giant Leap“.
- Prevent the abuse of the GWP-Accounting and change GHG-Accounting von GWP to GTP.
- Development of own future targets for long- or short-lived greenhouse gases.
- Establish an site-adapted agriculture.



Thank you for your attention