Snapshot: Assumptions with Respect to the Long-term Climate Mitigation Scenarios within the SUPREMA project

- Simulate implications of different mitigations for below 1.5°C or 2°C temperature increase targets by a potential "carbon taxes" on agricultural non-CO_2 emissions;
- Variant 1 considers mitigation policy implemented only via carbon price on agricultural non-CO_2 emissions ("agriculture ");
- Variant 2: assumes Variant 1 plus increased biomass use from agricultural land by energy plantations and additional afforestation, thus, testing whether this is delivering synergies or trade-offs with non-CO_2 emission reductions ("AFOLU + BE").

Assumption	Scenario	2020	2030	2040	2050	2060	2070
Carbon tax on agricultural non-CO_2 emissions (USD2005 / t CO_2)	2°C "RCP2p6"	7	3	118	192	353	469
	1.5°C "RCP1p9"	10	181	476	678	1070	1417
Additional biomass use (EJ) from energy plantations	2°C "RCP2p6"	8	17	36	57	94	118
	1.5°C "RCP1p9"	6	15	73	123	139	151
Additional afforestation compared to 2020 (million ha)	2°C o "RCP2p6"	0	10	113	206	260	317
	1.5°C "RCP1p9"	0	17	161	276	370	420

- Regional segmentation: To assess potential leakage effects that might lessen the EU mitigation action a carbon price on agricultural non-CO_2 is implemented by a unilateral effort in the EU or by global effort additionally including the Rest of the world (RoW):

Setup	Approach
Setup 1 ("EU, unilateral")	Carbon tax only implemented inside EU
Setup 2 ("World, global")	Assumes that the RoW takes coordinated efforts to implement a carbon tax as 0%, 5%, 10%, 25%, 50 %, or 100% of the value

Role of consumer behaviour in mitigation

- To test effects of shifting dietary preferences two scenario variants implemented:

Scenario variant 1 "None"	Assuming business-as-usual diet projections
Scenario variant 2 "Diet+Waste"	Dietary shift of total livestock calorie consumption to recommended levels and a 50% reduction in food waste

Implementation

- Countries consuming more than 430 kcal/capita/day (threshold) animal products, consumption is cut linearly from 2020 levels to 430 kcal/capita/day in 2070;

- Models explaining calories available for consumption including waste will be corrected for household waste:
    - New threshold will be equal to 430/(1-waste%/100) where the waste% is 11% for Europe, Russia, North America and Oceania, 8% for Industrialized Asia and North Africa, West and Central Asia, 2% Sub-Saharan Africa, 4% for South and Southeast Asia, and 6% for Latin America

The following table summarises the possible assumption/variant combinations forming 9 different scenario variants:

Scenario name	Mitigation target	Mitigation region	Mitigation sector	Consumer side mitigation
Baseline	None	None	None	None
1p5deg_WLD_AG	RCP1p9	World	Agriculture	None
1p5deg_WLD_AG_DIET	RCP1p9	World	Agriculture	Diet+Waste
1p5deg_WLD_BE	RCP1p9	World	AFOLU+BE	None
1p5deg_WLD_BE_DIET	RCP1p9	World	AFOLU+BE	Diet+Waste
1p5deg_EU_AG	RCP1p9	EU	Agriculture	None
1p5deg_EU_AG_DIET	RCP1p9	EU	Agriculture	Diet+Waste
1p5deg_EU_BE	RCP1p9	EU	AFOLU+BE	None
1p5deg_EU_BE_DIET	RCP1p9	EU	AFOLU+BE	Diet+Waste