NORWAY

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Pathway Narratives

	A) CURRENT TRENDS	B) NATIONAL COMMITMENTS	C) GLOBAL SUSTAINABILITY	JUSTIFICATION
General description	**We do not act differently than in the past decade/today**	**National actions/policies are aligned with national commitments**	**National actions/policies are aligned with global sustainability targets**	
Country Narrative - main elements that have guided the selection of the assumptions under each pathway	The OECD Environmental Performance Review of 2022 says that Norway has made progress towards green growth over the past decade. They highlight the heavy investments in technological investments and innovation to support the green transition. They also mention the widespread use of renewables, the electric vehicle adoption and the effort towards decarbonizing all transport sectors. However, they also point out areas for improvement and the multiple challenges faced by the country such as sustainable consumption patterns and biodiversity protection. In general, Norway has ambitious targets and commitments regarding the environment, but the actions and policies needed to meet these goals are not always in place or not in place yet.	The OECD Environmental Performance Review of 2022 sums up Norways commitments with "Norway set ambitious national environmental targets across all sectors. Its national targets on climate mitigation are among the most ambitious worldwide." Norway aims at achieving reducing national emissions by 55% and reach climate neutrality by 2030, and reduce emissions by 90-95% abd becoming low low-emission society by 2050.	As Norway is one the countries with the most ambitious targets, the global sustainability scenario is very similar to the scenario "B) national commitments".	Assessment and recommendations | OECD Environmental Performance Reviews: Norway 2022 | OECD iLibrary (oecd-ilibrary.org)

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Pathway Assumptions					
		A) CURRENT TRENDS	**B) NATIONAL COMMITMENTS**	**C) GLOBAL SUSTAINABILITY**	**JUSTIFICATION**
1. Macroeconomics	**1.1)** GDP per capita	SSP2	SSP1	SSP1	
	1.2) Population	SSP2	SSP1	SSP1	
	1.3) Inflation	SSP2	SSP1	SSP1	
	1.4) Inequalities	SSP2	SSP1	SSP1	
2. Land	**2.1)** Constraints on agricultural expansion / deforestation	We assume no expansion of agricultural land beyond 2010 agricultural area levels. Agricultural land could expand into new areas, but largely this is constrained to areas on peat soils, and there are specific policies accepted and detailed to prevent this.	Same as A)	Same as A)	Statistics Norway - Area data The National Forest Assessment: Volume data
	2.2) Afforestation, and forest plantations targets	We do not expect afforestation/reforestation. The total forest area has not changed very much since 2007 (UNFCCC, 2020b) and we expect this trend to continue. From 2007, growth in standing cubic biomass has been reduced annually	Same as A)	Same as A)	National Inventory Submissions 2020. UNFCCC, 2020b SSB table 06288 SSB table 06289

		indicating that forest is reaching maturity.			
	2.3) Urban and settlements area	Current trend (2011-2023): small increase in building areas for homes, cabins, and services (from 1.8 to 2.2% from 1990 to 2020) - Here we assume that this trend will continue as it is now, a small increase over time. Otherwise, densification in urban areas	Attention to cabin areas, with the aim of slowing growth in these. Here we will assume a continued but reduced growth over time going towards an asymptotic but not reaching zero. There is no fixed target for this, but a guestimate is a gradual decrease in growth down to 1% in 2040/2050 Otherwise, densification in slowly growing urban areas	Same as B)	Statistikkbanken Instructions for using Statbank - Land use and land cover Measure analysis for the forest and land use sector (LULUCF)
	2.4) Protected areas	Protected areas remain stable: by 2050 they represent 15% of the total land area. Recent findings show that while Norway is getting closer to the goal of protecting a representative share of Norwegian nature, a considerable number of threatened species are located outside protected areas in populated areas.	Following the Montreal-Kunming agreement 30% protection and 30% restoration by 2030 of combined marine and land areas.	Same as B)	Kunming-Montreal Global Biodiversity Framework Miljødirektoratet, 2We assume 020

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3. Productivity and management	**3.1)** Crop productivity for the key crops	Apart from changes driven by the climate change scenario, no changes were made to crop productivity in Norway in the FABLE Calculator. Because the climate change scenarios did not include yields for the top three crops in Norway (barley, oats, and potatoes), the yields of these three are therefore the same in 2050 as in 2010. NOTE: Yields are highly dependent on weather - e.g., drought in summer, and heavy precipitation in autumn. That goes both for food crops and feed crops, with repercussions for meat production (e.g., early slaughter).	Same as A), but with slow increase in fruit and veg productivity, slowly closing yield gap in grain production. Crop production: increase in 75% of fruit and vegetable production from "3.5 to 5 per day". The Norwegian share in fruit/veg production and consumption be increased by 50%	Same as A)	Statistics Norway - Data on grains Statistics Norway - Data on Fruit, veg Vegetable sector toward 2035 Yield gap change
	3.2) Cropland under agroecological practices	Stable around 5%. The national target for 15% organic produce by 2020 was abandoned.	The new strategy (2018-2030) is to stimulate organic production in line with demand. As no numerical target is available, we assume a small increase between BAU and the EU green deal target: a slow increase in organic production, to 10% in 2050.	Assume the EU Green Deal target of 25% of agricultural land under organic farming by 2030.	Statistics Norway - SSB
	3.3) Livestock productivity for the	Productivity for all meat (beef, pork, chicken, lamb: 15-20%),	Between 2021-2030, Norway has committed to reduce	Same as B), and following Nordic Dietary Health	Statistics Norway - Data on animals

	key livestock products	milk (30%) and eggs (34%) has increased since 1990 per animal. There are biological and technological limits to a linear continued increase. - Milk is assumed to have reached a limit - Beef: 0.6% increase per year - Pork meat: 0.4% increase per year - Lamb meat: increase by 0.1% per year - Chicken meat: stable - Eggs: increase by 0.1% per year	emissions from agriculture (mostly livestock) by 5 Mt, mostly through improved animal production (including methane blockers, better feed, fertilizer management, animal welfare), and without changes in animal numbers. Planned emission reductions over the 10-year period in agriculture itself are 2.6 Mt in total (around 6% down from 2021 level). For the period 2030-2050 there is no plan, but national climate commitments require the agricultural sector to approximately half its emissions by 2050 compared to 1990 – a task which is not possible without strong reductions in livestock. We assume productivity remains stable.	recommendations, with reduced livestock production, extensification, and increased food grain and vegetable production.	Statistics Norway - Data on Meat: Landbruksdirektoratet- Data on eggs/milk Statistics Norway - The National Forest Assessment Farmers union climate agreement and climate plan (2021-2030) Norwegian Climate law and climate politics
	3.4) Pasture stocking rate	By 2050, the average ruminant livestock stocking density is 5.82 TLU/ha.	Same as A), but with increased pasture use over larger area (extensive pastures, alpine meadows)	Extensification with a reduction in livestock, reduced stocking rate. Guestimate 3 TLU/ha	Uncertain - many farmers rent area in addition to owning - number of animals outside varies per season.

					Government Hurdal platform commits to increased extensive pasture use Consequences of New dietary guidelines for area, livestock, food production and climate
	3.5) Forest management	Productive forest area has increased since 1996, stable since 2007. Standing cubic mass increasing since 1990, annual growth rate stabilized since 2004. Assume stable standing biomass onward, with increased disturbances.	Same as A)	Uncertain. It comes back to the issue of grass vs forest. Forest has larger total (above+below ground) carbon, but lower albedo, and different species composition.	Landsskogtakseringen (ssb.no)
4. Trade	**4.1)** Share of consumption which is imported for key imported products (%)	Import agr. products are about 20% larger than exports, and total import and export has increased over time. Norway is mostly (90%) self-sufficient for animal products, around 75% for potatoes, 40% for grains and vegetables, and 10% for fruits. These numbers vary a bit between years. BAU assumes continuation accordingly	Increase (feed corrected) self-sufficiency from 40% to 50% (Hurdalsplatform) - see also 3.1	Reduce imports, increase national plant-based food production and production of feed, and reduce livestock.	Hurdalsplatform Resourcetrade.earth
	4.2) Evolution of exports for key	Increased from 2 Mt to 2.8 Mt for fish and seafood from 2000 to 2020, and from around 150	Decrease soy import (and export) (value unknown),	Same as B)	FAO – Food balances

	exported products (1000 tons)	kt to around 300 kt for soybeans. In BAU we assume a continued increase with the same growth rate.	increased self-sufficiency (40 to 50%)		
5. Food	**5.1)** Average dietary composition	Current average daily per capita calorie consumption = 2838 kcal (Hdir) 28% grains, 20% dairy, 13% meat, 1% eggs, 2% fish and seafood, 9% sugar, 7% oil and fats, 6% fruits and vegetables, 4% potatoes, 3% nuts and seeds, 7% rest (beverages, misc.). BAU assumes stabilization.	We assume Norway will follow the New Nordic Dietary Health recommendations: Reduce red meat (from 800 g/week to 350 g/week), dairy (from 880 g to 250-500 g/day), reduce alcohol, increase fish intake from 30 g/day to 42-64 g/day, and fruit and vegetables from 300 to 500-800 g/day by 2030.	We assume Norway will follow the New Nordic Dietary Environmental recommendations: Same as B) but reduce red meat to 200 g/week, and dairy to lower end of dairy range (250-500 g/day) intake.	Health directorate report (Hdir): Energy composition diet > 23,6 1000 TJ / 5442000 population = 1036036 kJ/person/year = 2838 kcal/person/day New Nordic Nutritional Recommendations (NNR22) for health and environment
	5.2) Share of food consumption which is wasted at household level	Around 48% of total food waste happens at consumption level. BAU assumes continuation of this same level.	20% reduction in 2020 compared to 2015 (failed, reached 15% in 2020) 30% reduction in 2025 compared to 2015 50% reduction in 2030 compared to 2015.	20% reduction in 2020 compared to 2015 30% reduction in 2025 compared to 2015 50% reduction in 2030 compared to 2015	FAO – Food balances Matvett – about food waste National calculation of the amount of food waste at the consumer level
6. Biofuels	**6.1)** Targets on biofuel and/or other bioenergy use	By 2050, biofuel production from rape oil increases by 8% compared to 2010. Norway has a plan to increase the share of biofuels – biodiesel and bioethanol – in fossil fuels, where the main policy tool is a mixing	Same as in A) By 2050, biofuel production from rape oil increases by 8% compared to 2010.	Same as in A) By 2050, biofuel production from rape oil increases by 8% compared to 2010.	Statistics Norway - Production and consumption of energy, energy balance and energy accounting Biofuel plans (Environmental Agency)

		requirement for dealers. From 2023 the requirement is 17 % biofuels of which 12.5 % should be advanced biofuels (i. e. based on waste products, not crops). Currently, 75% of biofuel is advanced. The mixing requirement for aviation is 0.5% biofuels. The government has proposed a 6% biofuel mixing requirement for the maritime sector from autumn 2023.			National Regulations on restrictions on the use of chemicals and other products hazardous to health and the environment (the product regulations) https://blogg.sintef.no/sintefenergy-nb/status-biodrivstoff-2022/
	6.2) Targets on other non-food use	-	-	-	-
7. Water	**7.1)** Irrigated crop area	The number of holdings with irrigation has decreased from 2000 to 2020 from around 14.5% to 12.6% (as proportion of holdings with crop production). The area with irrigation is limited to these holdings, and the area that can be irrigated in 2020 has decreased by 37% (as proportion of 2000 area) In BAU we assume this to be further reduced over time following the same trend.	Recent droughts have sparked discussions around adaptation and irrigation needs. The government recognizes the issue, but there is little commitment for increased support for this. Assumption: slow increase in climate adaptation support (irrigation and drainage) towards 2050.	Same as in B)	Holdings and area with irrigation Holdings cultivating various crops and average area, by size of agricultural area in use Agriculture and Food Minister- Answers to written questions about drought preparedness