

What does "Climate Neutral" really mean, and what are the implications for sustainable development?

Rolf André Bohne¹, Cristian Solli², and Håvard Bergsdal¹

¹ Department of Civil and Transport Engineering, Norwegian University of Science and Technology, Høgskoleringen 7A, NO-

7491 Trondheim, Norway

² MISA AS, Innovasjonssenter Gløshaugen, Richard Birkelandsvei 2b, NO-7491 Trondheim, Norway.

An operational approach to sustainable development is being "Climate Neutral". But what does carbon neutral really mean for each and every one of us, and further how to translate this information into our day to day activities. This paper explores and discusses carbon neutral first in an international context, before it is operationalized with respect to Norwegian emissions, and where a development projects like Brøset should focus its efforts.

IPCC has warned us about passing the 550ppm CO₂ concentration threshold in the atmosphere. We have therefore chosen this concentration of CO₂ in the atmosphere as an operational limit to for sustainability in our calculations. This does however mean that our annual emissions of CO₂ must decrease rapidly, especially towards 2050, but all the way towards 2100. At the same time the world population will increase to approximately 9 billion in 2050. This means huge reduction in emissions – especially in the developed world.

We looked at the emissions for Norway (2005) from two different perspectives; the production perspective, and the consumer perspective. We have limited this survey to green house gasses.

The household consumption is the single most important driver for Norwegian emissions, responsible for ca. 70%, or 36 million tons CO₂e.

Thus if we operationalize "climate neutral" to mean that the climate change should not exceed the 2 degree increase in temperature for a population of 9 billion, and that the distribution of emissions should be evenly distributed to all inhabitants on earth, that each should have an average emission of 3 tons CO₂ annually, or 2 tons per capita in households

We have also shown that with the consumer perspective that the emissions cannot be traced back to a few components, but that they are interlinked through the economic system. Thus there is no "quick fix", and that a holistic approach to the problem is necessary. The picture changes if we look at the same emissions from a production perspective. The most important category is then electricity production abroad.

This paper has thus identified key design areas to focus on in future developments in Norway (and comparable economies): energy, transportation, buildings and infrastructure and local production and consumption.