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People's opinion of climate policy

Popular support for climate policy alternatives in Norway

Marit Sjøvaag Marino, Nils Erik Bjørge , Torgeir Ericson, Per Arild Garnåsjordet, Håkon T. Karlsen, Jørgen Randers, Daniel Rees

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CICERO
Center for International Climate
and Environmental Research
P.O. Box 1129 Blindern
N-0318 Oslo, Norway
Phone: +47 22 85 87 50
Fax: +47 22 85 87 51
E-mail: admin@cicero.uio.no
Web: www.cicero.uio.no

CICERO Senter for klimaforskning
P.B. 1129 Blindern, 0318 Oslo
Telefon: 22 85 87 50
Faks: 22 85 87 51
E-post: admin@cicero.uio.no
Nett: www.cicero.uio.no

Tittel: People's opinion of climate policy- Popular support for climate policy alternatives in Norway

Forfattere: Marit Sjøvaag Marino, Nils Erik Bjørge , Torgeir Ericson, Per Arild Garnåsjordet, Håkon T. Karlsen, Jørgen Randers, Daniel Rees
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Hvordan kan vi vite om nasjonal klimapolitikk er tilstrekkelig? Hvilke moralske prinsipper kan en slik politick bygge på? Svarene på slike spørsmål er helt sentrale når man skal utvikle et rammeverk for klimapolitikk, men er ofte ikke gjort eksplisitte I den politiske debatten. Denne artikkelen søker å rette på dette ved å rapportere fra en nasjonal spørreundersøkelse.

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1. Introduction

How can we evaluate whether national climate policies are sufficient? Which moral principles should be the basis of our policy efforts? The answers to these questions are central to the development of any climate policy framework, but not always made explicit in daily political discourse. In this article we seek to redress this imbalance through a survey of popular opinion in Norway.

The Kyoto agreement has among other things provided a means for the general public to evaluate national climate policies[1]. With all its shortcomings, it has given a yardstick for the development of the level of national GHG emissions. However, the Kyoto agreement on its own will not be sufficient to avoid significant climate change. To make matters worse, it looks as if the possibilities of achieving international agreement for a new framework post-Kyoto are diminishing rapidly. A fresh approach is needed. In this article we ask whether there is public support in Norway for a national climate policy based on an alternative to the traditional, state-centred utilitarian, cost-efficiency-seeking approach to problem-solving.

There are good reasons for broadening the debate about climate policy to embrace questions about morality. The use of criteria for economic efficiency and cost-effectiveness are not ethically neutral, even if they are often portrayed as such (Vatn 2002). The problems associated with climate change are not purely scientific but also concern how we ought to live and how humans should relate to each other and to the rest of nature (Jamieson 1992). These are problems of ethics and politics. Hulme (2007) argues that in order to make progress about how we manage climate change we have to take science off centre stage, that it is necessary to have debates about wider social values. Naustdalslid (2011: 250) goes even further, asking for a methodology of knowledge production which includes values and societal interests. However, the nature of the democratic political process is such that "[w]e cannot expect democratic governments to implement policies that might endanger their prospects of re-election" (Compston 2009: 1).

Our contribution in this paper is to present the results of an empirical investigation into views on climate policy goals in Norway. It draws its intellectual inspiration from Greaker et al (2012) on Kant's categorical imperative as basis for national climate policy; Should Norway implement climate policies *as if* an ambitious global climate agreement were in place?

This paper is written as part of a larger project on sustainability indicators in Norway. Central to the project is the idea of the precautionary principle and its implications for policy. The precautionary principle implies that policymakers have a responsibility to protect the public and the environment from exposure to harm when scientific investigation has found a plausible risk, and take prudent measures in situations of scientific uncertainty. In the case of anthropogenic climate change such action must lead to the (rapid) reduction of emission of greenhouse gases (GHGs).

[1] We use the term 'climate policy' to mean policy that is intended to reduce the emission of greenhouse gases.

2. Research questions and methodology

We seek to answer the following questions:

Is there popular support in Norway for the principle of adopting a climate policy *as if* a sufficient global agreement were in place? (A sufficient global agreement would limit the risk for a global temperature increase of >2°C to 50%, in line with the IPCC recommendations.)

- What are the main characteristics that define those in favour of such a policy?
- How satisfied is the population with current Norwegian climate policies?
- How does current policy fare in comparison to such ambition levels?

To answer these questions we use results from a web survey (CAWI) conducted in November and December 2010 (close in time to the Cancun summit). The poll comprised 1008 respondents from the TNS GallupPanel, weighted by gender, age, education and geography to represent the Norwegian population.

3. Background

The absence of an international binding treaty on GHG emissions has for many years been a problem for the development and implementation of national climate policies. Greenhouse gases do not stop at national frontiers, but fills the common sink that is our atmosphere. Therefore, many argue that the necessary reorganisation of economies will only bring disadvantages (e.g., lower competitiveness) to those countries undertaking it, unless all countries agree to reduce their emissions. This is being used in many national contexts to postpone or avoid emission reduction efforts. Moreover, the public is generally divided on the need for strong climate policies. Climate policies that might be expensive (in the short term) or that might reduce individual choice are not typically seen as vote-winners.

From a state-centred *utilitarian* vantage point, the sensible way to process in the absence of an international treaty is to comply with existing regulations as cheaply as possible (Greaker et al (2012). In this way can states ensure maximum welfare (in the short term) for their citizens.

In a Kantian perspective, however, the emphasis is on developing national climate policies that can serve as 'universal laws', so that if all countries implemented such policies, the chances of a temperature increase of more than 2°C would be less than 50% (in line with the IPCC). We call such policies "Kantian climate policies".

Greaker et al have suggested a number of characteristics of a Kantian climate policy:

- a self-imposed national emissions path for future emissions (based on a chosen distribution of the remaining carbon budget)
- a self-imposed national emission tax (based on the lowest tax level for each year that would result in the necessary emissions reductions, country specific)
- a self-imposed national R&D effort relevant for emissions reductions (measured in money, number of man-years and output in the form of e.g., patents and demonstration plants.).

Thus, Greaker et al do not point primarily to the need for physical indicators like atmospheric concentrations of CO_2, but for indicators that measure whether current policy is adequate. The three bullets in the list above constitute a useful starting point for such indicators.

All three elements are vigorously debated in academic and political arenas across the globe, and none of them have easy solutions that are ubiquitously agreed upon. Our contribution in this article is to present findings on Norwegian popular support for a Kantian climate policy, in particular on a self-imposed emissions path, and state funded R&D.

4. Support for the principle of a Kantian climate policy

The first question in our investigation is whether there is popular support for the principle of implementing a Kantian climate policy in Norway, i.e. to behave *as if* an ambitious global climate agreement were in place.

We would expect correlation between peoples' acceptance of an ambitious national climate policy and their perception of the level of seriousness of anthropogenic climate change. This is supported by other empirical studies (e.g., DfT 2011; Barnes and Coan 2010; O'Connor, Bord and Fisher 1999). There are at least two possible causal explanations for such correlation. People who perceive the problem as serious will most probably accept tough measures to solve the problem. Alternatively, their perceptions might be influenced by political action: if politicians manage to agree on ambitious target for reduction of greenhouse gases, the public might infer that anthropogenic climate change is a serious threat and thus be more supportive of wide-ranging measures.

The question posed was "The Copenhagen summit in 2009 did not result in an international climate agreement, and most probably the same will be true for the Mexico summit in 2010. Should Norway still act as if an ambitious global climate agreement exists?" Four alternative possible answers were given:

- Yes
- Yes, but only if other countries do the same
- No
- Don't know

Table 1: Should Norway still act as if an ambitious global climate agreement exists?

	Frequency	Nomination
Yes	54 %	'Kantians'
Yes, but only if other countries do the same	26 %	'Non-Kantians'
No	12 %	'Non-Kantians'
Don't know	8 %	

When asked directly, a majority of the Norwegian population (54%) was in favour of high national ambitions in climate policy, even without an international agreement. A further 26% were in favour of doing so if other countries did the same. Only 12% of the population was against Norway having ambitious climate policy goals in the absence of an international agreement. For practical reasons we shall here call the first group the Kantians, and the second and third groups the non-Kantians. We emphasise that these are convenience labels only, and that our data do not give room for interpreting individuals' wider ethical basis. There are several possible options why individuals respond 'yes' to the question above, one of which is that they live by a Kantian ethics, but this is by no means the only possibility.

We have data on how these respondents spread over political parties. Figure 1 shows that two of Norway's parliamentary parties score very high on the support for a Kantian policy, with

more than 4 in 5 voters in favour. These parties are the socialists and the liberals, both traditionally viewed as environmentalist parties. The figure also shows that the distribution broadly follows the classical left-right axis, with the voters on the left being more positive to an ambitious climate policy than those on the right of the spectrum. The party the least positive to Norway pursuing a Kantian policy is the Progress party (extreme right), whereas the Socialist Left are the most positive. However, it is worth noting that in none of the parties (the Progress Party included) is the share of those in favour of a Kantian policy less than 26%, and for five of the seven parties represented in the Norwegian parliament is the approval of a Kantian climate policy higher than 50%.

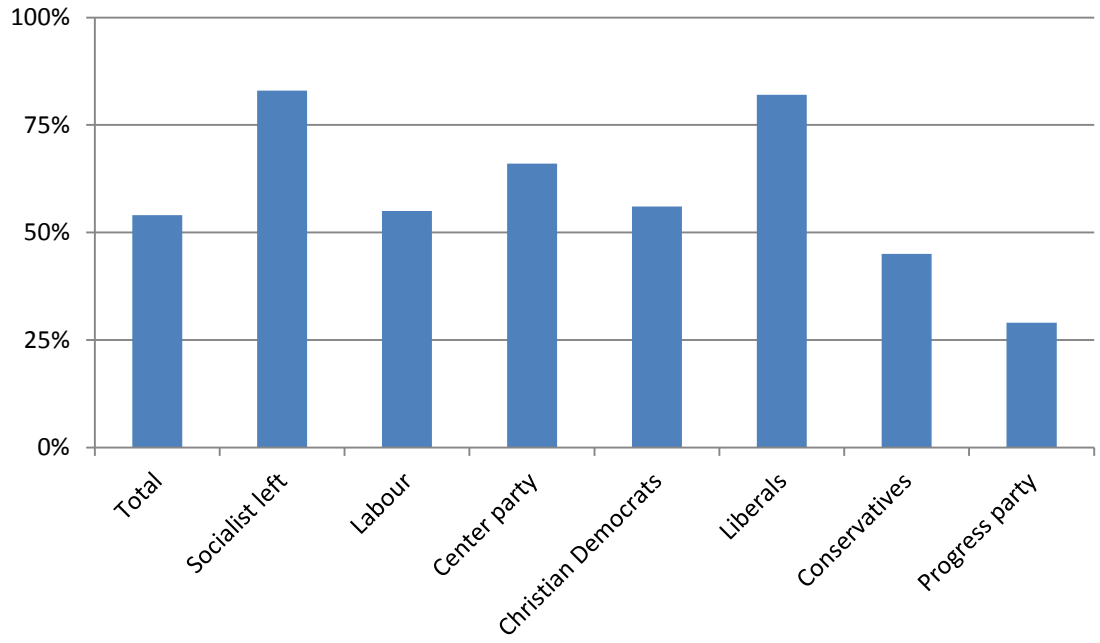

Figure 1 – Support for a Kantian policy by political party

5. Who are the Norwegian Kantians?

So far, we have shown that more than half of the Norwegian population think we should behave *as if* a global climate agreement were in place (we have labelled these 'Kantians'). Kantians are more likely to be found to the left in the political spectrum.

We now turn to the task of identifying factors that are determining for Kantians. Based on regression analysis we have developed a model seeking to identify which factors are determining for the opinion that Norway should act *as if* an ambitious climate agreement were in place. We have chosen to name the dependent variable 'Kantian,' and by using logistic regression analysis we calculate the probability for different variables to have an effect on a Kantian view in climate policy, after controlling for other variables.

	Exp(B)[2]
Male	0,80
Age	0,98*
High school (Baccalaureat level)	2,41*
Higher Education	3,24*
Belief in anthropogenic climate change	1,52*
Worry about climate change consequences	1,32*
Trust in climate science	1,64*
Knowledge about global energy situation	1,30
Income beneath 300.000 NOK	1,13
Income above 600.000 NOK	1,16
Progressive Party	0,68
Conservative Party	1,15
Christian Democratic Party	1,17
Centre Party	1,15
Socialist Left Party	2,04*
Liberal Party	3,45*
Did not vote last election	0,81
Positive to state intervention	1,33*
Constant	0,01

Dependent variable: Kantian. n=774. Nagelkerke R^2=0,4.

Table 2: Regression model

The model is developed through several steps[3], and the model assumptions are tested and found satisfactory. Our final model (Figure 2) indicates that *age*; *education*; *belief in anthropogenic climate change*; *worry about climate change consequences*; and *trust in climate science* are factors which explain the propensity to hold a Kantian view on climate policy (factors are significant on a 0.05 level). The effect of the variables *gender*; *knowledge about the global energy situation*; and *income* are not significant, and do not explain differences in opinion. Further, we find significant effects from both party preference and attitude towards state intervention. For political parties, we have used the Norwegian Labour Party as reference category, and the analysis shows that voters of the Liberal Party and the Socialist Left Party are more likely to have a Kantian view than voters of the former[4]. An interesting finding in the analysis is that attitudes to state intervention still has got a significant effect after controlling for the other variables. This suggests that scepticism towards state intervention is an important factor in determining whether an individual is in favour of a Kantian approach to climate policy.

[2] Exp(B) greater than 1 indicates larger propensity to have a Kantian view on climate policy, while Exp(B) less than 1 indicates less propensity.

[3] By using list-wise exclusion of respondents with missing values on any of the variables, we end up with 774 respondents in the final model. Inclusion of all but the income variables contributes to a significant improvement of the model.

[4] Before controlling for attitudes to state intervention, voters of the Progressive party is less likely to have a Kantian view.

To sum up, the typical Norwegian Kantian:

- is younger rather than older
- has higher education at university level
- believes in anthropogenic climate change
- is worried for the consequences of climate change
- trusts climate science
- votes with the socialists (Sosialistisk Venstreparti) or the liberals (Venstre)
- is generally positive to state intervention.

6. Satisfaction with Norwegian climate policies

We now turn to the task of analysing how satisfied the respondents are with climate policy as it is perceived at the time of polling. We group our data under three headings:

- Overall satisfaction with policies
- International solidarity
- Technology policy (hereunder research and development, renewable energy sources, and CCS)

a) Overall satisfaction with climate policies

We have data from two questions posed relating to respondents' overall satisfaction with climate policies:

Table 3: Norwegian politicians do far too little to reduce GHG emissions in Norway

	Kantians	**Non-Kantians**	**Total**
Agree (Partly / strongly)	73 %	41 %	59 %
Neither agree nor disagree	18 %	32 %	24 %
Disagree (Partly / strongly)	7 %	21 %	13 %
Don't know	2 %	6 %	4 %
SUM	100 %	100 %	100 %

Table 4: Norway is an international pioneer on climate issues

	Kantians	**Non-Kantians**	**Total**
Agree (Partly / strongly)	44 %	35 %	40 %
Neither agree nor disagree	27 %	36 %	31 %
Disagree (Partly / strongly)	25 %	22 %	23 %
Don't know	4 %	7 %	5 %
SUM	100 %	100 %	100 %

Table 3 shows that over half of the Norwegian population think Norwegian politicians do far too little to reduce national emissions. The proportion is markedly higher among the Kantians, where almost three quarters agree with the statement.

We would argue that the high percentage of respondents agreeing with the proposition should be seen as a strong indication that politicians have significant leeway to introduce more ambitious climate policies without fearing electoral revolt.

Even when taking into consideration methodological issues with framing (it is inherently easier to agree with a statement than disagreeing), the statement is quite strongly worded (*politicians do far too little*) and the result therefore warrants to be seen as strong support for an ambitious national policy.

Table 4 shows that the population is split in the view of Norway's international achievements. 40% agree that Norway is an international pioneer, whereas 23% disagree. The relative distribution is roughly the same among Kantians and non-Kantians, with Kantians somewhat more positive to Norwegian international performance. This goes slightly counter to intuition, in that one would expect those who do not want Norway to take on higher than Kyoto obligations to be happy with the country's international performance. However, we also do not know whether respondents think Norway *should be* an international pioneer. Moreover, one should note that close to a third of the population (31%) neither agree nor disagree with the statement, which may indicate relative contentment as well as ignorance.

b) International solidarity

Views on international solidarity play an important part in the discussion of Kantian climate policies. Fundamentally, a Kantian climate policy will rely on ethical choices about how the remaining carbon budget should be distributed among nations (Greaker et al, 2012). We have data from three questions relating to international solidarity.

As discussed in Greaker et al, there are several competing distributive models, each with their specific consequences. Greaker et al discuss five different models[5], and conclude that 'egalitarianism' is the one 'closest to Kantian ethics'. We believe this debate is far from closed.

However, what seems to be clear from their discussion is that the models differ in whether they take historical emissions – and their resulting economic power – into account or not. On the one side is the principle of sovereignty ('grandfathering') where past emitters should be held harmless and their current emissions constitute a right established by past usage, implying that all countries shall cut equal percentages from a given historical level (say, 1990). On the other side are the four other models, all of which imply that rich countries (i.e. those with the highest historical emissions) shall do more than poor countries to cut emissions.

For the clarity of argument here, we shall see this overarching principle that rich countries pay more than poor, as the most significant determinant of Kantian ethics, rather than singling out the egalitarian model.

In our data material the respondents were asked which of five distributive models in their view constitutes a just distribution. The results are presented in tables 5 and 6. Furthermore, we asked about their view on the principle of cost-efficiency, presented in table 7.

[5] The models they consider are (1) 'sovereignty', which posit that all countries shall make equal percentage cuts from a historic emission level; (2) 'egalitarianism', in which all global citizens should have equal emissions rights; (3) 'ability to pay', so that rich countries should pay for abatement; (4) 'comparable costs', where countries spend comparable proportions of their GDP on abatement; and (5) 'historical responsibility', in which past emitters should pay according to their past emissions.

Table 5: There is an international discussion on the distribution of climate policies between countries. Which distribution do you think is just?

	Kantians	Non-Kantians	Total
All countries shall make similar cuts from today's emission level	11 %	19 %	15 %
Each country shall have the right to emit the same amount of GHGs per capita	4 %	14 %	9 %
Rich countries must cut their emissions more rapidly than developing countries	49 %	34 %	42 %
Rich countries should pay significantly more to reduce GHG emissions than poor countries	34 %	18 %	27 %
Don't know	3 %	14 %	8 %
SUM	100 %	100 %	100 %

Table 6: What requirements should be put upon developing countries for GHG emissions?

	Kantians	Non-Kantians	Total
Developing countries should have emission limits, but not as strict as for industrialised and transition countries	61 %	53 %	57 %
Developing countries should not have emission limits, but have requirements that emissions are kept lower than 'business as usual'	9 %	8 %	9 %
Developing countries should not have emission limits. Cuts in these countries should rather be stimulated through financial and technology transfers from other countries.	22 %	18 %	20 %
Don't know	8 %	21 %	14 %
SUM	100 %	100 %	100 %

Table 7: The most important is to cut GHGs where cheapest, even if this is in another country

	Kantians	Non-Kantians	Total
Agree (Partly / strongly)	34 %	49 %	41 %
Neither agree nor disagree	22 %	26 %	24 %
Disagree (Partly / strongly)	40 %	16 %	29 %
Don't know	4 %	9 %	6 %
SUM	100 %	100 %	100 %

Interpretation of these data needs context. The different distributive models themselves are complex, and the 'one-line versions' presented in the questionnaire are not necessarily mutually exclusive. Moreover, there has been only very limited attention to these questions in general, and the distributive models in particular, in Norwegian public debate. One would therefore assume the general level of knowledge about the different options to be poor.

However, we would argue that it is possible to draw two conclusions. Firstly, the answers show a positive attitude to rich countries carrying a larger share of the burden for emissions reductions than poor countries. Table 6 shows that more than half of the population, and as much as 61% of the Kantians, think poor countries should carry a less onerous burden than rich countries. This principle can, we argue, be seen as the most significant determinant for Kantian ethics. Secondly, it is striking that what Greaker et al (2012) identify as the Kantian model (i.e., same rights of emissions per capita) is the least popular choice among all groups of respondents, including the Kantians. We attribute this mainly to the lack of awareness and public discussion about these issues.[6]

As table 7 shows, non-Kantians (utilitarians) are more concerned with cost-efficiency than are Kantians. The converse is also true; more Kantians than non-Kantians do *not* see cost-efficiency as the most important.[7] Non-Kantians are also more likely to prefer similar (percentage) cuts in rich and poor countries than the Kantians, which indicates that the responses are consistent.

c) Technology policies

We shall now look at the satisfaction with another of the characteristics of a Kantian climate policy: a self-imposed national effort in research and development of technologies with a potential for reducing GHG emissions.

Our data measure popular support in three key areas: the state's effort in relation to renewable energy, the degree to which the state should finance currently non-profitable R&D in new energy sources, and the Norwegian CCS effort.

Table 8: Norway does not commit enough to the expansion of renewable energy**.**

	Kantians	**Non-Kantians**	**Total**
Agree (Partly / strongly)	86 %	68 %	78 %
Neither agree nor disagree	8 %	22 %	14 %
Disagree (Partly / strongly)	5 %	5 %	5 %
Don't know	2 %	4 %	3 %
Sum	100 %	100 %	100 %

A large majority (78%) of the Norwegian population thinks the country is not doing enough to expand its renewable energy capabilities (table 8). This is a remarkable result for two reasons. Firstly, electricity generation in Norway is traditionally based on hydropower, widely seen as a climate neutral technology. The virtual non-existence of a market for clean electricity certificates in Norway is typically attributed to the fact that people think their electricity already is carbon neutral. Public authorities regularly boast about the high degree of renewable energy in the Norwegian energy mix.

[6] There is a growing awareness and debate around ethical issues in climate change, as indicated by a growing number of books, academic journals and articles on the subject. This debate, however, seems to be largely limited to academic communities, and less pronounced in public political discourse.

[7] The relatively large group of neutrals might reflect that cost-efficiency has been less prominent in Norwegian debate than in many other countries with less spending power.

The second reason this result is remarkable is that the drivers for renewable energy typically observed in other countries, such as energy security and the need to meet international (EU) regulations, not really apply to Norway.[8] As a consequence, successive governments have achieved very little in the area of new renewable energy over the last decades. Such strong criticism of national achievement is a blow to the government in this area, and an indication that much stronger efforts are sought by the general public.

Maybe most striking of all is the uniformity of responses among Kantians and Non-Kantians. Not surprisingly, Kantians strongly believe that Norway does too little to promote renewable energy use, with 86% thinking the government should do more. But also the non-Kantians are unimpressed with Norwegian renewable energy deployment, where 68% agree with the statement.

Table 9: To what degree should the state finance R&D of new energy sources, even if it is currently economically unprofitable?

	Kantians	**Non-Kantians**	**Total**
Large / very large degree	83 %	54 %	70 %
Some degree	14 %	32 %	22 %
Little / very little degree	1 %	6 %	4 %
Don't know	3 %	8 %	5 %
SUM	100 %	100 %	100 %

State funding of research and development relevant for emissions reductions has strong popular support in Norway (table 9). More than two thirds of the population believe that the state should finance R&D in new renewable energy sources to a high or a very high degree. Only 4% of the total population think that the state should only marginally or not at all finance such R&D.

Again we find a similar pattern across the ethical groups, with Kantians being overwhelmingly in favour of state funding of R&D, and the non-Kantians less so but still positive to state funding. We can think of several reasons for this. Firstly, there is a strong tradition of state funding of research activities in Norway. Secondly, the state traditionally has a strong position in energy research, typically through the petroleum sector. Thirdly, arguments about future competitiveness hinging on our ability to take part in the 'green revolution' that many believe is underway, might give even 'non-believers' ('climate sceptics') reasons to support as much R&D as possible.

[8] Norway's energy security is high. The RES directive from the EU, intended to drive investment in renewable technologies, is seen as relevant for EEA countries. The Norwegian government was at the time of the poll in negotiations with the EU Commission on the exact level of demands for renewable production.

Table 10: Do you agree that Norway should use substantial resources to develop CCS technology?

	Kantians	Non-Kantians	Total
Agree (Partly / strongly)	59 %	34 %	47 %
Neither agree nor disagree	15 %	22 %	18 %
Disagree (Partly / strongly)	8 %	18 %	12 %
Don't know	18 %	26 %	22 %
Sum	100 %	100 %	100 %

Responses about carbon capture and storage (CCS) increases the complexity of the picture (table 10). CCS has been high on the political agenda in Norwegian climate policy, and is portrayed by the Norwegian government as one of the most salient national contributions to global GHG emissions reductions in the future, and the most high-profile technological development. Media attention and political pressure have been high for two main CCS projects in Norway, and there have been several instances of setback for CCS proponents in the form of delayed/annulled projects and technical problems over the last years. Despite this, popular knowledge about CCS remains relatively low (only 12% of respondents claim to have a good or very good knowledge about CCS) and 22% have no opinion on whether Norway should use large resources on CCS technology development. Almost half of the population (47%) think Norway should use large resources on this technology, and this proportion increases to about two thirds among those who claim a good knowledge of the area.[9]

As we would expect, those in favour of a Kantian climate policy are most positive to using resources on CCS, with 59% in favour. Among the non-Kantians this number is 34%, making it nearly twice as likely for a Kantian to be in favour of the CCS effort as a non-Kantian.

Therefore, whereas there is broad popular support for more renewable energy and even broader support for state funding of currently non-profitable energy sources, controversy is more pronounced in the case of CCS. This might be because of poor performance and consequent negative media attention over the Mongstad and Kårstø projects. However, it might also be that the public easily pay lip-service to the undoubtedly good, uncontroversial goals of renewable energy and research and development, but find it more difficult to accept specific projects with all its practical and economic problems. (A parallel might be drawn with attitudes to wind farms).

7. Current policy in a Kantian perspective

In Norway, there exists a preferred national path for future emissions. Six of the seven parliamentary parties have agreed an emissions path until 2020. This path stipulates that Norway shall reduce emissions by 30% compared to 1990 levels by 2020, of which two thirds (i.e., 15-17MtCO_2/year) shall be reductions from Norwegian territory (as opposed to buying quotas in the market).

[9] These results tally with the situation in other countries, see http://www.geos.ed.ac.uk/ccs/Publications/Reiner1.pdf

We shall in this section see where this agreement (if implemented) will take us in terms of probabilities of avoiding a temperature increase >2°C in a Kantian perspective.[10] We combine this with data on popular support for ambition levels for Norwegian GHG emissions in 2020.

a) Popular ambition level

Respondents were given the opportunity to place what they thought should be the emissions level in 2020 on a sliding scale. They were given information about the target levels for central policy actors such as the parliamentary consensus, individual political parties, prominent interest groups and the EU.

Table 11: In your opinion, how much should Norway emit in 2020?

	Kantians	**Non-Kantians**	**Total**
< 44MtCO_2e/yr (i.e. more ambitious than current policy)	86 %	55 %	72 %
less ambitious than current policy	14 %	45 %	28 %
SUM	100 %	100 %	100 %

Table 11 shows that there is strong popular support for a more ambitious binding path for future emissions than the current one. 72% of the population was of the opinion that the target should be more ambitious than 44MtCO_2e/yr in 2020, which is the current consensus in the Norwegian parliament. Less than 5% wanted a target above current emissions of 50 MtCO_2e (2010).

b) Norwegian policy as global model?

We shall now try to see how current Norwegian policy could fare as a global model. We assume that all global citizens have the right to emit the same amount of GHGs, and that all countries implement policies similar to that of Norway. We use the model developed by Meinhausen et al (2009) to find the probabilities of keeping warming to an 'acceptable level'[11] in this century.

Meinhausen et al "provide a comprehensive probabilistic analysis aimed at quantifying GHG emission budgets for the 2000–50 period that would limit warming throughout the twenty-first century to below 2 °C" (...) They show that "both cumulative emissions up to 2050 and emission levels in 2050 are robust indicators of the probability that twenty-first century warming will not exceed 2 °C relative to pre-industrial temperatures" (p. 1158).

Given the scope of this paper our analysis is only meant to illustrate our qualitative argument. We use the following central data, which are rough approximations:

Global emissions in 2010:	50 GtCO_2e
Global population in 2010:	7 billion
Global emissions 2000-2010:	500 GCO_2e
Norwegian emissions in 2010:	50 MtCO_2e
Norwegian population in 2010:	5 million

[10] The model works from the assumption that the remaining carbon budget will be distributed equally among all persons.

[11] A temperature increase of less than 2°C relative to pre-industrial levels.

The size of the remaining global carbon budget depends on the probability for not exceeding a 2°C temperature increase. Table 12 shows corresponding probabilities, remaining global carbon budgets, Norway's share of this budget, the year Norwegian emissions have to reach zero given a linear downward path from 50MtCO_2e in 2010, and resulting Norwegian emissions in 2020 (again given a linear path from 2010).

Probability for temperature increase <2°C	**Global carbon budget 2000-2049 (Meinhausen et al 2009):** **GtCO_2e**	**Global carbon budget 2010-2049** **GtCO_2e**	**Global carbon budget per capita** **tCO_2e**	**Norway's share of global carbon budget** **MtCO_2e**	**Year of zero emissions**	**Resulting Norwegian emission in 2020** **MtCO_2e**
80%	1356	856	122	610	2034	27.1
74%	1500	1000	142	710	2038	30.4
67%	1678	1178	168	840	2044	33.8
50%	2000	1500	214	1070	2053	37.2
25%	2625	2125	303	1517	2070	40.8
10%	3075	2575	368	1839	2083	42.5

Table 12 – probabilities for meeting the 2°C target and corresponding Norwegian emissions in 2020[12]

Figure 2 illustrate these results graphically

[12] The cumulative total CO_2 equivalent gas emission for 10% and 25% are found by using the illustrative default in Figure 3 in Meinhausen et al (2009), and assuming cumulative CO_2 emissions constitute two-third of total emissions (see p 1160).

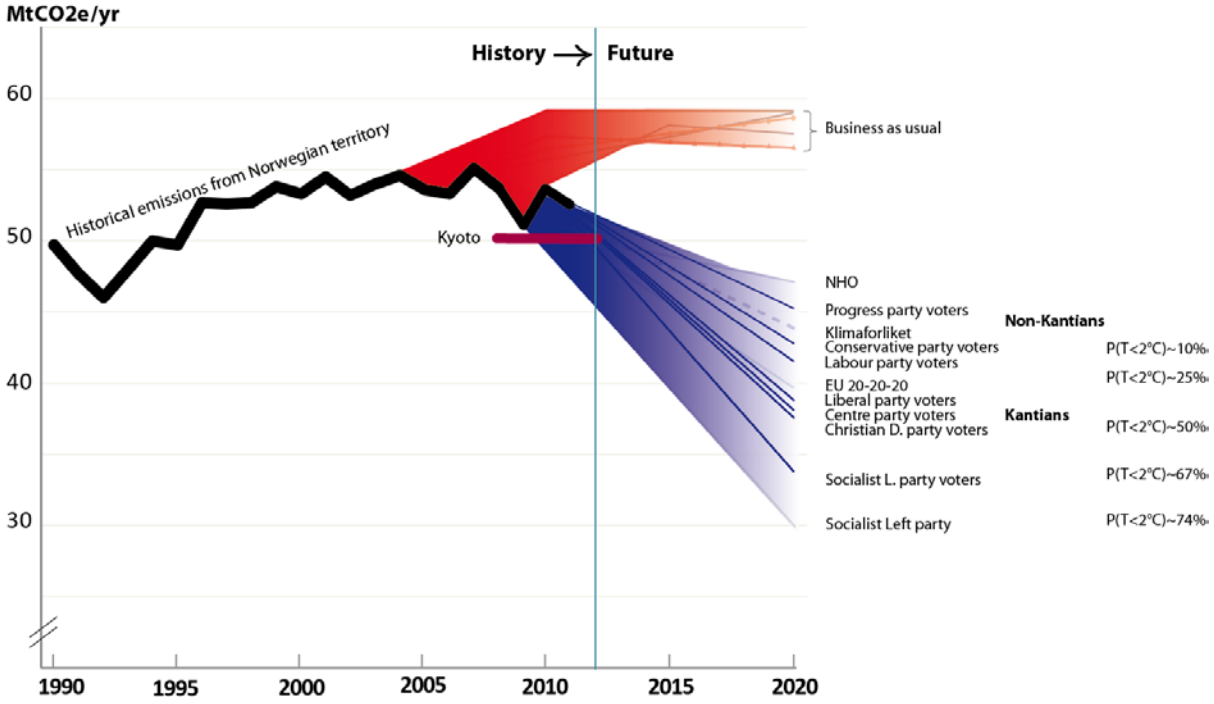

Figure 2 Desired emission levels in 2020 for Kantians and Non-Kantians; different probabilities for meeting the 2°C target with corresponding Norwegian emissions, given that the carbon budget is distributed equally among the citizens of the earth; and different Norwegian policy objectives.

This graph shows the Norwegian emission paths necessary to avoid a temperature increase of more than 2°C with a given probability. For instance, if we want to ensure 80% chances of not exceeding a 2°C increase and apply an egalitarian distribution of the remaining carbon budget, Norwegian emissions must be 27 $MtCO_2e$ in 2020, further declining to 0 in 2034. However, if we allow for a 50% chance of not exceeding the target temperature increase of 2°C, Norwegian emissions in 2020 should be 37 $MtCO_2e$, going to zero in 2053.

The figure also shows the desired emission levels in 2020 for the two groups, Kantians and Non-Kantians, with approximately 38 $MtCO_2$ and 44 $MtCO_2$ respectively. We note that the Kantians are close to the 50% probability level, which corresponds to the level used in the definition of the Kantian policy at page 3. We also note the Non-Kantians are at the same level as agreed upon in Klimaforliket.

It is interesting to compare the probabilities with what the public desire and what some political goals for the year 2020 are. The figure therefore also shows what the respondents, distributed by political parties, answered should be the Norwegian emissions in 2020. The line indicating "Klimaforliket" shows an agreement between 6 of the 7 main parties on Norway's goal for 2020 (The Progress Party did not agree). Included is also the NHO - Confederation of Norwegian Enterprises. The Kyoto goal shows Norway's commitment according to this agreement. EU 20-20-20 indicates what Norway would need to do in order to follow the EU's scheme of 20 percent cut in emissions by 2020, compared with 1990.

The current Norwegian consensus (Klimaforliket) fixes the domestic target emissions in 2020 at 44 $MtCO_2e$/yr. According to our model, this implies that we accept more than a 90% probability for a temperature increase of more than 2°C, if the emissions continue declining with the same rate.

8. Concluding remarks

A Kantian approach to climate policy might sound removed from the concerns of day-to-day politics, where short-termism and narrow cost-benefit analyses often seem to carry the day. The long-standing focus on 'rational' behaviour within a short-term and geographically narrow frame, to the extent that it has become taken for granted, has rendered talk about morals and ethical choices unfashionable. However, the response to the climate challenge needs the opposite of narrow frames both in time and space. The consequences are long-term and global.

Given the nature of the democratic political process, elected governments will want to enhance their possibilities for re-election, and not to implement policies that are highly unpopular. And since climate policies can mean paying now for future (uncertain) benefit, they are not the natural vote-winners, which reduced their chance of being implemented.

The data we have presented in this article give some ground for optimism. When asked directly, the Norwegian population express strong support for ambitious climate policies even in the absence of a binding global agreement. We have found popular support for state funding of new technologies aimed at emissions reduction, and most people think rich countries should do more than poor ones to meet the climate challenge. Consequently, because Norway is a very rich country by any standard, we should do more than most. This is also echoed in the result that almost four out of five think Norway does too little to promote renewable energy expansion.

One might opine that our results are 'too good to be true', that it is easy to take the moral high ground when there are no real direct costs involved. However, we would argue that the level of support for ambitious climate policies in general, of rich countries carrying a larger share of the burden, and of state funding of renewable energy technologies, particularly in the light of the consistency of the opinions expressed, should inspire any decision-maker to adopt more ambitious policies.

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