

Energy & the Environment: Influence of Greening Technologies on Public Perception

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Purpose:

The purpose of this project was to gauge participant perspectives on greening technologies for fossil fuel production and to analyze whether greener production technologies would result in a shift towards more positive public attitudes towards the fossil fuel industry

Background:

Environmental concern serves as a source of opposition to the production of almost all types of energy.(1-7) Discourse surrounding environmental ethics and impact of human activity on the environment continues to grow steadily and has inevitably become intertwined throughout various aspects of government, business, and industry action and policy(8) . Concern for the environment has generated both criticism of business/industry practices as well as a heightened consumer demand for green products and technologies(9). A number of studies have demonstrated that organizations offering more environmentally friendly options can positively influence consumer perceptions and behavior (10). As a result, many organizations are emphasizing environmentally friendly values in order to both address criticism and tap into consumer perceptions(11). The fossil fuel energy industry in particular has received a substantial amount of backlash for the environmentally damaging nature of extraction and production technologies currently in use.

This has moved industry towards more environmentally friendly products and practices in order to gain the benefit of the more positive consumer attitudes and behaviours seen to be associated with greener technology and products.

Methods and Sample:

We generated an online survey, using the survey monkey platform. We distributed the survey link via convenience and snowball sampling that ascertains the views from various demographics on the topic. The majority of respondents were Canadians between the ages of 18-65, of which 31.4% were male and 68.6% female. Although a range of occupational demographics was represented, the majority of participants self-identified as being academically affiliated (students n=99, teachers/researchers n=44) with individuals also identifying from the following occupations: technical (n=24), NGO/CSO (n=24), international organization (n=12), government (n=11), and industry (n=11). Participants identified other occupations in addition to those listed but these represented less than 5% of respondents. Two hundred and fifteen participants (n=215) responded to the survey; however, response rates to specific questions varied. Therefore, specific n values are reported for each result.



Table 2b. Renewable Energy: Perspectives of Hydrocarbon Industries and Projected 2030 Energy Mix for Canada:

Current Opinion of Production/Extraction	Projected Energy Mix (%weighted m an)						
	Win	Sola	Biomar	Geotherm	Tida	Woo	n
Oil							
Essential to do but has problems	50	2	48	25	42	1	41
Environmental impact needs great improvement	41	4	39	4	36	3	25
Should not be done	39	13	41.5	13	27.5	8	27.8
Acceptable as extracted today	28.3	6	30.0	6	20.0	6	21.7
Natural Gas							
Essential to do but has problems	57.1	14	52.9	14	48.2	11	39.1
Environmental impact needs great improvement	46.9	39	43.5	40	33.3	33	30.0
Should not be done	27.5	8	25.0	8	17.5	4	22.0
Acceptable as extracted today	25.0	6	30.0	7	20.0	6	25.0

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Table 1. Perspectives of Hydrocarbon Industries and Acceptance of Greening Technologies

Current Opinion of Production/Extraction	Green Technology Acceptance (weighted mean response out of 10)			
	Stimulation via microbial communities	Genetic alterations of bacterial metabolic enzymes	Utilizing biological end products in target environments	Creating unique biosynthetic organisms
Oil				
Essential to do but has problems	7.23	31	5.88	30
Environmental impact needs great improvement	5.72	58	4.36	57
Should not be done	0.13	14	0.25	14
Acceptable as extracted today	5.25	8	4.75	8
Natural Gas				
Essential to do but has problems	8.00	17	5.67	17
Environmental impact needs great improvement	5.52	50	4.58	49
Should not be done	0.00	7	0.00	7
Acceptable as extracted today	6.43	10	5.7	10

Table 2a. Non-renewable Energy: Perspectives of Hydrocarbon Industries and Projected 2030 Energy Mix for Canada

Current Opinion of Production/Extraction	Projected Energy Mix (% weighted mean)			
	Oi	Ga	Cos	Nuclea
Oil				
Essential to do but has problem	19.1	23	20.9	23
Environmental impact needs great improvement	36.7	42	21.0	41
Should not be done	5.0	11	8.0	11
Acceptable as extracted today	18.3	6	25.0	6
Natural Gas				
Essential to do but has problems	21.7	12	22.7	12
Environmental impact needs great improvement	18.9	37	21.1	36
Should not be done	4.0	5	4.0	5
Acceptable as extracted today	28.3	6	31.7	6

Results (sample):

- When asked whether energy is a critical resource either globally or locally, 87.3% and 95.4% of participants responded yes respectively for either category (n=138).
- On a 10-point scale, 10 being "the most severe" and 0 representing "not an issue" of the five options offered, over consumption, environmental damage, and energy sources were identified as the most severe issues with weighted means of 8.6, 8.4, and 7.8 respectively while equity (weighted mean= 6.9) and lack of energy (weighted mean= 4.2) were rated the least severe issues overall
- In regards to the perception of oil and gas, 44.9% and 39.7% of participants indicated the need to improve the environmental impact of oil and natural gas extraction in Canada. Furthermore, participants also identified that current oil sands and coal bed methane extraction requires modification in order to become more environmentally friendly, with 52.9% and 34.1% of participants respectively identifying this as a concern (table 2).
- Of participants who identified reducing environmental impact as being necessary for oil extraction (n=60), 65.0% agreed that greening oil extraction would positively influence their perception of the industry (table 3). Similarly, 80.8% of participants who identified the reduction of environmental impact as being necessary for natural gas extraction (n=52) agreed that making natural gas extraction and production more environmentally friendly would positively influence their perception of the gas industry (table 2).
- Of the one who stated that all oil sand operation should cease (n=18) 64.7% would not change their views on the oil sand operation whereby 23.5% would become more positive; as to coal bed methane operations 70.% would not change their negative view while 23.5% would become more positive toward coal bed methane operations

Conclusions:

- The results suggest that greening would generally create a more positive public perception of the oil and gas industry;
- Shifts in perspective due to greening were not encountered in every case.
- It is not a foregone conclusion that every greening solution will be met with approval (table 3).
- The results of the survey suggest that potential barriers to influencing public perception of the hydrocarbon energy industry exist that may need to be addressed in addition to making technologies more environmentally friendly.

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