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Fostering citizen deliberations on the social acceptability of renewable fuels policy: The case of advanced lignocellulosic biofuels in Canada

Holly Longstaff [a,1], *David M. Secko* [b,*,1], *Gabriela Capurro* [a], *Patricia Hanney* [a], *Terry McIntyre* [a]

[a] *Centre for Structural and Functional Genomics, Concordia University, 7141 Sherbrooke Street West, GE S120.02, Montréal, Québec H4B 1R6, Canada*

[b] *Department of Journalism and Centre for Structural and Functional Genomics, Concordia University, 7141 Sherbrooke Street West, Montréal, Québec H4B 1R6, Canada*

ARTICLE INFO

Article history:
Received 29 April 2014
Received in revised form
10 December 2014
Accepted 5 January 2015
Available online

Keywords:
Deliberative democracy
Social acceptance
Biofuels
Policy
Public engagement

ABSTRACT

It is widely recognized that a lack of social acceptance is likely to hinder the ability of governments to achieve policy targets concerning renewable energies. In this paper, we discuss the results of a pre- and post-test online survey that was conducted as part of the 2012 "Advanced Biofuels" deliberative democracy public engagement event in Montréal, Québec. The event sought to foster public learning and discussion in order to produce socially acceptable policy input for one type of renewable energy: advanced lignocellulosic biofuels. Survey results show that the majority of participants were strongly supportive of advanced lignocellulosic biofuel development in Canada after the deliberative event. By the end of the event, support also grew for current Canadian biofuel policies and many agreed that increasing biofuel production should be widely supported by the Canadian public. However, despite this support, about two thirds of participants revealed that they did not feel included in government decisions about biofuels. The gap between support after inclusive deliberation and expressed exclusion from Canadian government decisions points to the importance of fostering future citizen engagements in this area of renewable energy policy.

1. Introduction

It is widely recognized that a lack of social acceptance is likely to hinder the ability of governments to achieve policy targets concerning renewable energies (see Ref. [1] for a good discussion of social acceptance; and more recently the review by Ref. [2]).[2] While notions that this acceptance or resistance is simply the result of insufficient information have been

* *Corresponding author.*
E-mail address: david.secko@concordia.ca (D.M. Secko).

[1] These authors contributed equally to this manuscript.

[2] The term *social acceptability* is defined in section four of this paper according to descriptions outlined in Wüstenhagena et al., 2007.

http://dx.doi.org/10.1016/j.biombioe.2015.01.003
0961-9534/

heavily criticized [3], consensus has emerged that the development and governance of emerging technologies should be subject to public engagement and informed democratic deliberation [4]. As a result, many organizations from around the world now view public engagement as a means to address difficult ethical and social debates, promote education and awareness, and diversify perspectives in order to inform public policy [5].

Survey results from the 2012 "Advanced Biofuels" deliberative democracy event held in Montreal, Quebec, Canada offer insights into how to foster public learning and discussion in order to produce input to policy on the social acceptability of one type of renewable energy, namely advanced lignocellulosic biofuels. For the purposes of this event, advanced lignocellulosic biofuels were defined as liquid biofuels for transport that are made using lignocellulose – a non-food feedstock (e.g., switchgrass) composed of plant cell walls – as opposed to solid municipal waste or algae [6]. Advanced biofuels attempt to sidestep some of the criticisms of first generation biofuel production related to issues like food security and concerns over land-use [7,8], so are frequently argued to be more environmentally friendly. This is despite their high production costs, understudied sustainability, and unknown economic and social impacts [9]. Canadian interest in advanced biofuels is supported by the Renewable Fuels Strategy (RFS), announced in 2006 by the Federal government [10]. This strategy involves a mandated *5% bioethanol blend in all ground transportation fuels*, *2% biodiesel* blend for both ground transportation fuels and home heating fuels, and financial incentives for the biofuels industry [11]. Such Canadian polices have been controversial, in part, due to environmental questions over the promotion of corn ethanol usage and taxpayer costs.[3] Subsidies, for example, are estimated to cost the Canadian federal government up to one billion dollars by 2017, which is added to the $100-billion already spent worldwide since 2005 [12].

While a limited literature pertaining to public opinion [14] and stakeholder concerns [40,42] regarding biofuels policy and other related topics [41] does exist, there is a significant dearth of research into public deliberations concerning advanced biofuels specifically, perhaps due to the difficulty in securing funding for such research generally or due to the complex nature of this topic. As a result, little is currently known about how the lay public views first or advanced generation biofuel development and production in Canada or worldwide [13,14]. What is known suggests that consumer acceptance of biofuels is driven at least in part by a desire for more socially and environmentally responsible products [15], fuel reliability [16], the influence of the media [17,41], and nationality [18]. This paper provides some of the first results that speak to the social acceptance levels of advanced lignocellulosic biofuels following informed deliberative democratic engagement conducted with a diverse group of lay citizens. The results compliment research documenting, for example, the impacts of NGOs on biofuel use [42], public opinion of energy technologies from the 2010 Eurobarometer [43], and arguments for a lack of broad stakeholder inclusivity in biofuel policy development [44], as well as wider literatures in overlapping areas such as bioenergy for heat and power [45].

[3] The Canadian RFS and its implications are further discussed in Hanney et al., 2013.

2. Material and methods

Democratic deliberation aims to both educate and seek advice from lay citizens. It differs from other forms of engagement (such as opinion polling) that risk collecting 'top of the head' responses or creating phantom opinions from uninformed or misinformed citizens. Instead, democratic deliberation fosters considered decision making through thoughtful reflection and in-depth discussions between diverse participants [19]. Democratic deliberation is therefore a unique form of conversation that encourages participants to respectfully challenge the views of others while justifying their own positions in order to arrive at representative conclusions. As explained by Ref. [20], democratic deliberation is "*… aimed at producing reasonable, well-informed opinions in which participants are willing to revise preferences in light of discussion, new information, and claims made by fellow participants.*" *(p. 309)*. Essentially, democratic deliberation is based on the notion that policy development around certain topics which are contentious, politicized, or in need of input from a wide range of perspectives, will benefit from opening the topic to public deliberation [21].

The 2012 "Advanced Biofuels" in-person deliberative democracy event took place over two non-consecutive weekends in Montréal, Québec. The deliberation included significant learning sessions, small and large group deliberations, and pre- and post-test online surveys to anchor the qualitative portions of the event. This deliberative process of participatory governance has been repeated twelve times on various science policy issues [22]. Below we briefly report the methods specific to this study (additional information on the model can be found in Refs. [5,22,23]).

While this study rejects the widely critiqued "deficit model" of public understanding of science [3], we see accessible, transparent information about the engagement topic as an essential step that helps to create a suitable environment for deliberation [24]. The 2012 "Advanced Biofuels" deliberation began with an information phase (Phase 1) in which participants heard expert presentations on topics such as the science behind biofuel production, feedstock management, costs and economic viability, biofuel by-products, and the social implications of biofuel development, followed by a Q & A period with each speaker. The four experts included two scientists, an industry representative and a social scientist. Participants were also invited to drop questions into a basket anonymously throughout the first weekend, which would be answered by a relevant expert the following weekend. In addition, participants received an information booklet to review a few weeks before the event after they had completed the pre-test online survey. This booklet was intended to introduce them to the various issues (both positive and negative) associated with biofuel development from a diverse