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Experts and expertise in practices of citizen engagement in climate policy: a comparative analysis of two contrasting cases

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Abstract
The need for engaging citizens in climate policymaking is increasingly recognised. Despite indications that the form of expert involvement can strongly influence participatory processes, this remains scarcely researched. We analysed two unique and contrasting cases of citizen engagement in national climate mitigation policy: (1) the Irish Citizens' Assembly (ICA), the first national climate assembly involving live expert presentations and face-to-face deliberations; and (2) the Participatory Value Evaluation (PVE) on Dutch climate policymaking, where more than 10,000 citizens compared policy options in an online environment based on expert-based information on policy effects. Taking a dramaturgical approach, we found that the opening up and closing down of policy options and perspectives was influenced by the setting, staging and scripting of expertise. Apart from providing information on policy options, experts had significant roles in design choices and formulating recommendations, which shaped citizens' deliberations and policy advice. In deliberative processes, citizens' deliberations can be further influenced by putting experts in a privileged spot and emphasising their authority, whereas in the setting of an online tool, experts' design choices may be masked by the fact-like presentation of expertise. Future research should further investigate the role of experts and expertise across a wider range of practices. Nevertheless, we conclude that the high degree of required technical knowledge in climate mitigation policy naturally implies strong expert involvement, which concomitantly steers the results. Alternatively, we may search to enhance citizens' engagement in guiding climate policymakers by focusing on citizens' normative perspectives.

Keywords Climate policy · Citizen participation · Expertise · Citizens' assembly · Mini-public · Participatory Value Evaluation

1 Introduction

Many countries have formulated ambitious mid-century emissions targets to achieve the Paris Agreement's objective to limit global mean temperature increase to well-below 2 °C and preferably 1.5 °C. Policymakers are therefore challenged with developing

Extended author information available on the last page of the article

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concrete national climate mitigation plans. Traditionally, climate mitigation policy is strongly informed by expert-based analysis of possible policy pathways, most notably model-based scenarios. However, given the far-reaching consequences of these policies, it is increasingly recognised that citizen engagement is crucial to ensure that newly implemented polices are socially just, acceptable and effective (Wüstenhagen et al. 2007; Langer et al. 2017; Batel 2020). Against this backdrop, a diverse range of citizen engagement initiatives in climate and energy policy have emerged over the past decade (OECD 2017; Chilvers et al. 2021; Galende-Sánchez and Sorman 2021).

This paper is concerned with the role of expertise given the recent advance of citizen engagement practices such as deliberative mini-publics like national climate assemblies (Willis et al. 2022). At first glance, citizen engagement may seem to counteract the traditional powerful roles of experts in climate policymaking, which has been widely criticised for devolving political questions into technical ones and favouring techno-economic solution orientations (Demeritt 2001; Beck and Oomen 2021; cf. Fischer 1990). One of the promises of participatory processes is their capacity to 'open-up' (Stirling 2008) towards wider polices and perspectives which experts and policymakers may overlook, alluding to citizens' value diversity, local knowledge and creative capacity to identify policy options (Fiorino 1990; Stirling 2008; Pesch et al. 2017). At the same time, access to specialised knowledge is broadly recognised as an essential ingredient of participation in environmental policy issues (Reed 2008; Brown 2014; Lightbody and Roberts 2019).

However, expert involvement across citizen engagement practices is highly diverse and there is little scholarly agreement on what form this should take (Lightbody and Roberts 2019). While empirical work on deliberative mini-publics on climate change reveals that expert involvement improves citizens' understanding, experts can also 'close-down' citizens' deliberations by imposing issue framings or forceful communication of policy options (Blue 2015; Courant 2020; Muradova et al. 2020; Elstub et al. 2021). These risks are particularly apparent in the context of climate policymaking, given its complexity and required technical knowledge. Nevertheless, expert involvement in citizen engagement practices in climate policy remains scarcely researched, which we address in this paper. In line with Stirling (2008), we do not argue that closing-down is problematic, as closure is arguably necessary regarding the urgent need for decisive climate action. Nor do we argue that expert analysis leads by definition to closing-down and participation to opening-up (Stirling 2008). Rather, we are interested in *how* the opening up and closing down unfolds in interactions between citizens and experts.

This research intends to answer the following research question: *How does expert involvement shape the dynamics of opening-up and closing-down of policy options and perspectives in practices that engage citizens in climate mitigation policy?* We compare two cases that both involved citizens in national climate policymaking, with contrasting formats of mobilising expertise: the *Irish Citizens' Assembly* (*ICA*) on climate change, a deliberative mini-public where a randomly selected group of citizens are informed through live expert presentations, and the *Participatory Value Evaluation* (*PVE*), a relatively new citizen engagement method recently applied to Dutch national climate policy, in which citizens evaluate and compare policy options based on expert-based information in an online environment (see Sect. 4 for theoretical, methodological and practical arguments for our case study selection). In the following sections, we first review theoretical understandings and empirical insights into the role of experts and expertise in citizen engagement in climate policy (Sect. 2), which informs our analytical approach to the analysis (Sect. 3). After explaining our methodology (Sect. 4), we first introduce both cases (Sect. 5) before

reporting our results (Sects. 6 and 7). In Sect. 8, we discuss the limitations of our research and the theoretical and policy implications of our findings.

2 Experts and expertise in citizen engagement practices: theoretical understandings and empirical insights

Specialised knowledge is widely recognised as an essential ingredient of public participation in complex environmental policy issues (Reed 2008; Brown 2014; Lightbody and Roberts 2019). A lack of engagement with scientific and technical expertise can easily result in 'negotiated nonsense' (Van de Riet 2003). Expert involvement has been theorised in depth, most notably in deliberative democracy literature (e.g. Habermas 1996; Fisher 2000). Although the preferred role of experts and expertise remains debated (Brown 2014; Roberts et al. 2020), a key rationale to involve experts in deliberative processes is to empower disadvantaged groups to form reasoned arguments (Knops 2006; Brown 2014). Empirical studies on deliberative mini-publics indeed find improved understanding and shifts in citizens' policy preferences as a result of information provision (e.g. Muradova et al. 2020; Elstub et al. 2021).[1] However, such a rationale would follow a 'knowledge deficit' model of expert-citizen interactions, which has been criticised for disregarding citizens' local and contextual knowledge (cf. Bulkeley 2000; Fischer 2000). A critical question is therefore what counts as relevant expertise, which is prone to political biases in the set-up of institutional routines (cf. Beck 1992). For example, Brian Wynne famously demonstrated how the authority of scientific expertise on radioactive contamination overruled farmers' crucial knowledge on the concrete need and extent of contamination reduction. This prioritisation of scientific expertise over social forms of knowledge blurs the 'cultural/hermeneutic character of scientific knowledge itself' and 'seriously constrains the imagination of new forms of order and of how their social legitimation may be better founded'. (Wynne 1996, p. 45). This may not be intentional. Scientific understandings are never neutral representations, but are inseparable from conceptions of social order (Jasanoff 2004). Scientific issue framings of citizen engagement practices can thereby close down citizens' deliberations (Blue 2015). The influence of experts on citizens' deliberations depends not only on the type of expertise, but also on experts' capacity to persuade the public (Brown 2014; Muradova et al. 2020; cf. Shapin and Schaffer 1985). In citizen engagement practices, it thus matters how experts communicate information (e.g. Muradova et al. 2020), what their assigned roles are and what format of expert-citizen interactions is chosen (e.g. Roberts et al. 2020). Relatively little scholarly attention has been paid to this 'dramaturgy' of expert involvement in citizen engagement practices, which is the focus of this paper.

[1] Empirical work on the role of information on opinion shifts in deliberative mini-publics shows contrasting results: where some find opinion shifts were influenced more strongly by information rather than deliberation (e.g. Goodin and Niemeyer 2003), others find the opposite result (e.g. O'Malley, Farrell and Suiter 2020).

3 Analytical approach to analysing expert-citizen interactions

Two premises underpin our analysis. First, we view citizen engagement processes as 'arenas' in which citizens and experts discursively engage in opening up and closing down policy options and perspectives (cf. Rydin 2007). We analyse how the *possibility space* takes shape throughout both cases, defined here as the range of possible policy options and perspectives that are discursively opened-up or closed-down by various actors (Sect. 6). With 'policy options', we mean specific policies that are aimed at mitigating climate change, such as subsidies for electric vehicles or granting legal rights to nature. With 'perspectives', we mean the normative perspectives of citizens when assessing the desirability of policy options, such as intergenerational equity or ecological impacts (see e.g. Bellamy et al. 2013 for a similar distinction). Second, the credibility of experts is not pre-given but continuously negotiated depending on the specific institutional context (Fischer 1990; Wynne 1987). In order to understand the process through which expertise becomes authoritative, we base our analysis on the 'governance as performance' framework developed by Hajer (2009) to analyse how actors gain authority in mediatised policy and decision processes. We apply this framework of dramaturgical analysis through three elements: scripting, staging and setting. *Scripting* refers to determining the specific roles and appropriate behaviour of the actors involved (Hajer 2009), in our analysis operationalised as the scripted roles that were assigned to experts during the design of each case (Sect. 7.1). *Staging* involves the specific organisation and sequence of events of the interaction between actors (Hajer 2009), here operationalised as the particular way in which experts are introduced and how information is presented (Sect. 7.2). The *setting* refers to the physical and organisational setting where the interaction takes place (Hajer 2009). In our analysis, we only attend to the physical setting (e.g. the room set-up/the format of the online tool: Sect. 7.2) and consider the organisational setting as the institutional embeddedness that we describe in the introduction of the cases (Sect. 5). The governance as performance framework was applied to reveal how the scripted roles of experts, the staging of expertise and the physical setting influenced dynamics of opening up and closing down of the possibility space.

4 Case study selection and methodology

4.1 Rationale for selecting the cases

Our case study selection was based on theoretical, methodological and pragmatic arguments (Seawright and Gerring 2008). The first and foremost theoretical argument for selecting the cases was their contrasting forms of expert involvement: a climate assembly involving live expert presentations, Q&A and small-group deliberations (ICA) vs. an online tool where citizens compare policy options based on expert-based information on policy effects (PVE). The PVE was also selected for pragmatic reasons: authors 1 and 2 were personally involved in the development of the PVE application on Dutch climate policymaking, which enabled insights into the design process and access to data. Where author 2 coordinated the PVE content, author 1 provided assistance in its design and took a more critical and reflexive stance, closely observing the design of the PVE and interviewing involved stakeholders afterwards. Moreover, authors 3–5 were not personally involved and therefore had a more critical distance. Although we recognise potential biases, we

considered the direct access to the design process and data outweighed this potential drawback (Sect. 8.3 for a reflection on potential biases). A pragmatic argument to select the ICA was data availability, being well-documented compared to more recently emerging climate assemblies. A methodological argument for selecting both cases was their similarity in their goal and scope, i.e. informing climate mitigation policy on the national level. We recognise that our cases might not be representative of other climate assemblies, PVE applications or democratic innovations more generally, which we reflect upon[2]in Sect. 8.3.

4.2 Methodology: data collection and analysis

The comparative analysis was based on a range of quantitative and qualitative methods (see Supplementary Information A). The ICA was analysed through document analysis (academic literature, reports and experts' papers and presentations), 12 semi-structured interviews with involved actors (Assembly members, the Secretariat, expert witnesses, the Expert Advisory group and observers), data from a quantitative survey derived from researchers studying the ICA (Supplementary Information A.4) and an analysis of open access video material[3] of expert presentations and Q&A sessions. Documentation on the ICA was used to reconstruct the process and outcomes of the ICA (Sect. 5) and the scripted roles of experts during the process (Sect. 7.1). Experts' papers and presentations were also analysed to reveal experts' proposed policy options to understand the extent to which citizens' recommendations reflected these proposals (Sect. 6). The survey results (Supplementary Information A.4) were used to gain insight into citizens' views on the provided information (Sect. 7.1). The video material revealed the room set-up (setting) and enabled analysis of how experts were introduced in opening speeches as well as how experts responded to citizens' questions (staging). The interviews were aimed at better understanding how the scripted roles of experts played out in practice and how the setting, staging and scripting influenced citizens' deliberations. The PVE case was analysed through a literature review, personal observations, a participant survey and three semi-structured interviews (Supplementary Information A). The description of the PVE case (Sect. 5.2) and the dynamics of opening up and closing down (Sect. 6) were reconstructed through personal observations of the design process (Supplementary Information F), literature review (academic literature on the PVE method and grey literature such as policy reports and parliamentary debates on this particular case), three semi-structured interviews to gain insight into the use of PVE insights in policy[4] and citizens' preferred policy options as reported in Mouter et al. (2021d).[5] The reconstruction of the scripted roles, setting and staging of expertise (Sect. 7) was based on

[2] Both the PVE and the ICA can be considered 'democratic innovations' that are aimed at deepening and expanding the scope of citizen engagement. However, these innovations are highly diverse (Elstub and Escobar 2017) and the democratic quality of deliberative mini-publics is contested (e.g. Curato and Böker 2016).

[3] This material is available on YouTube and is accessed between January 2022 and November 2022 https://www.youtube.com/channel/UC2DgyetL9aUTMry_F9B9yUw

[4] We recognise that 3 interviews may not capture the diversity of stakeholders' views. However, these were used to obtain some provisional insights into policy outcomes of the PVE which was not the core interest of our comparison and is only used in the case description (Sect. 5.2). See also Supplementary Information A.

[5] The quantitative analysis of preferred policy options of all PVE participants and the qualitative analysis of 2000 of the participants' open questions regarding their arguments for and against policy options as well as the open evaluative questions was performed by a group of 14 researchers including authors 1 and 2. The findings are reported in a Dutch report which is used as key reference in our results (Mouter et al. 2021d).

the presented information in the PVE as well as survey responses that participants filled in after completing their advice. Given the aim of this paper, we focused on 2000 citizen responses on two open questions regarding the positive and negative aspects of the PVE, which were analysed inductively by two PVE researchers (including author 1) (Supplementary Information A.3), which revealed insights into citizens' perspectives on the policy options (7.1) and the information provision (7.2).

5 Introduction to the cases

In this section, we provide an overview of the process and outcomes of each case (overview in Table 1 and Fig. 1) and provide background on their respective political and institutional setting.

5.1 Case 1: the Irish Citizens' Assembly on climate change

Although efforts to make democracy more deliberative and inclusive date back to the 1970s, Ireland is considered a pioneer of democratic innovations for two reasons: first, it is the first country where multiple nation-wide citizens' assemblies were held successively and second, the assemblies produced major political outcomes in the form of multiple successful referendums (Farrell et al. 2019; Courant 2021). The ICA (2016–2018) followed from two earlier citizen engagement initiatives in Ireland. The We the Citizens project (2011) which was initiated in response to the declining trust in the Irish government in the aftermath of the economic crisis (Farrell and Suiter 2019). One of its recommendations was to complement representative democracy with deliberative democracy processes, which formed the foundation to initiate, a 'pilot' citizens' assembly, the Convention on the Constitution (2012–2014), which resulted in two successful referendums on blasphemy and gay marriage (Farrell and Suiter 2019). The success of these two processes raised optimism for citizens' assemblies to address politically divisive issues, most notably the Eight Amendment of the Constitution concerning abortion. In July 2016, the ICA was approved by the Irish parliament, consisting of 99 randomly selected citizens and a chair person (a retired Supreme Court judge) to discuss five topics over the course of 12 weekends: the Eighth Amendment to the Constitution (concerning abortion), aging population, fixed term parliaments, the way referenda are held and climate change. The Eight Amendment was the most intensively discussed topic and resulted in a successful referendum.

Climate change was thus embedded as one of the five topics of the ICA and was only included after an amendment by the Green Party (Farrell et al. 2019; Harris 2021). Whereas climate change would initially be addressed as the final topic, Assembly members voted to move it to the third topic and devote two weekends to it instead of one (Courant 2020). The country had been known as a 'climate laggard' for many years, with the 2017 National Mitigation Plan being highly criticised for a lack of ambition (Torney and O'Gorman 2019). Moreover, the Assembly could provide an independent space to discuss climate policy, which is highly politically charged given the farming lobby in Ireland (Devaney et al. 2020). Over the course of two weekends, the Assembly engaged in an iterative process of listening to expert presentations, small group discussions and Q&A, culminating in a Ballot Paper that the citizens voted upon (see Fig. 1). Prior to citizens' deliberations, the organisers also invited the wider Irish society to submit ideas or proposals (The Citizens' Assembly 2018). A total of 1205 submissions were received by advocacy groups,

Table 1 Overview of characteristics of both cases

	ICA on climate change	PVE on national climate mitigation
Year	2017–2018	2020–2021
Number of citizens	99 citizens (population: 4.7 million)	10,810 citizens (population: 17.5 million)
Duration	Two weekends, 26 h of deliberation	20–30 min of evaluation
Policy goal and question	Open: 'how the State can make Ireland a leader in tackling climate change'	Specific goal: 'how to cut 55% emissions by 2030 compared to 1990'
Initiators	Government	Academic researchers
Institutional embedding	Continuous Assembly, formally embedded in policymaking process	No formal embedding in policymaking process, but aligned with National Climate Agreement
Key actors	Secretariat, Expert Advisory Group, expert witnesses, chair, citizens	PVE researchers, policy advisors, government representatives, citizens
Policy recommendations	13 recommendations in three sectors: energy, transport and agriculture	10 policy options in five sectors: energy, agriculture, transport, housing, industry
Policy outcomes	Recommendations reflected in policy strategies	Mostly discursive (results presented in letter to Ministry and presented to members of Houses of Representatives)
Format of providing information	Written papers, live expert presentations and Q&A	Expert-based policy characteristics in online environment

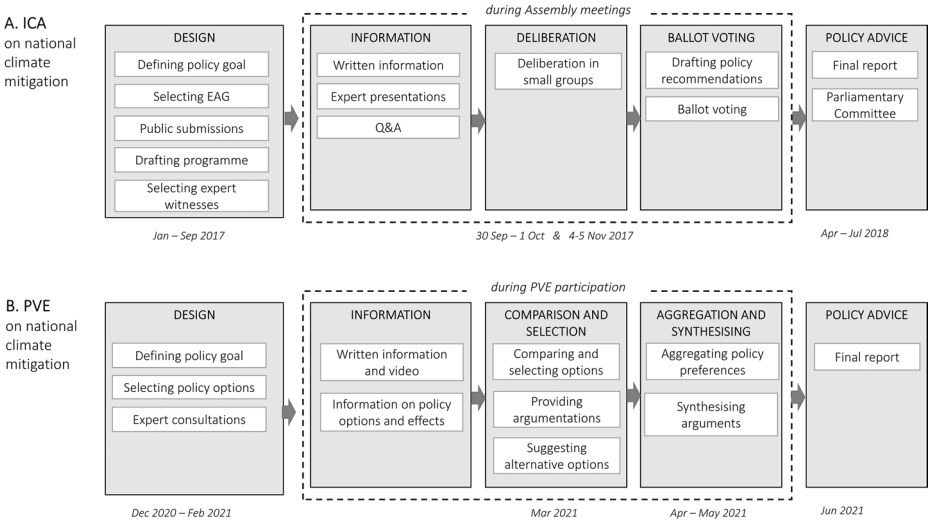


Fig. 1 Schematic overview of the phases of the ICA (**A**) and the PVE (**B**)

experts and citizens of which 1185 were published online, synthesised and sent to Assembly members alongside short papers by the expert witnesses.

The ICA on climate change resulted in 13 climate policy recommendations including a more general call to put climate change at the centre of Irish policy as well as sectoral policy recommendations across energy, transport and agriculture (The Citizens' Assembly 2018; Supplementary Information B for an overview). The recommendations were far more radical than many expected, especially the suggestion to introduce of a tax on GHG emissions in agriculture (Devaney et al. 2019; Torney and O'Gorman 2019). The latter was immediately refused by Ireland's prime minister as soon as the report came out (Coyne 2018). An all-party parliamentary committee was established that would consider the recommendations and to assess how this may inform Ireland's national mitigation strategy. In their final report, this committee endorsed most of the Assembly's recommendations, except the controversial tax on agricultural emissions (Devaney et al. 2019; Joint Committee on Climate Action 2019). Nevertheless, the 2019 Climate Action Plan and its amendment in 2021 reflected several of the Assembly's policy recommendations (Supplementary Information D). Since the ICA, citizen engagement has become a primary component in the Irish national mitigation strategy, including an online public consultation, a stakeholder forum and a youth assembly (Government of Ireland 2022).

5.2 Case 2: the Participatory Value Evaluation on Dutch national climate mitigation policy

The Participatory Value Evaluation (PVE) is a relatively new citizen engagement method that enables large groups of citizens to advise policymakers on public problems in an online environment, involving a range of policy options and their effects as well as a particular constraint, usually a public budget and a policy target. Citizens 'step in the shoes' of policymakers as it where, experiencing complex policy choices and trade-offs (Mouter

et al. 2022). The PVE method was explicitly designed to resolve several limitations of the traditional cost–benefit analysis that predominates Dutch policymaking (Mouter et al. 2021b). The method has recently been applied to various a range of policy issues, including the relaxation of national COVID-19 measures (Mouter et al. 2021a), urban mobility investments (Mouter et al. 2021b) and the energy transition (Mouter et al. 2021c; Itten and Mouter 2022). Since participants usually spend 20–30 min evaluating policy options, participation barriers are low and large groups of citizens can participate (Mouter et al. 2021c).

Inspired by previous successes, author 2 initiated its application to national climate policymaking. Compared to the ICA, the PVE was not formally embedded in the policy process, but was developed in close collaboration with representatives of the National Climate Agreement (2019). This Agreement outlines the Dutch national mitigation strategy, which was the culmination of a deliberation process among 150 stakeholders across five 'climate tables' (Rijksoverheid 2019). However, the National Climate Agreement was assessed as being largely insufficient in achieving its target (PBL Netherlands Environmental Assessment Agency 2019; 2020). Moreover, following the EU Green Deal, the Netherlands strengthened its national emission reduction target from 49 to 55% by 2030 compared to 1990 levels. In 2020, a Dutch politician filed a motion to consider ways to improve citizen engagement in climate policy, considering the failure to effectively engage citizens and the positive experiences with national climate assemblies in other countries (Mulder et al. 2020). These developments provided the background to initiate the PVE. All Dutch citizens could participate in the PVE through a website link. To ensure representativeness, citizens were also randomly selected by a market research company (hereafter called 'open PVE' and 'PVE panel'), resulting in a total of 10,810 participants. Figure 3b shows the online environment in which citizens could evaluate 10 policy options such as a meat tax, off-shore wind and electric vehicle subsidies (see also Supplementary Information B). Citizens could indicate their preference by using a slider for each option from 'no extra effort' to 'strong extra effort', while receiving real-time information on the extent to which their selected options reached the 55% emission reduction target. Clicking on a policy option revealed information on costs, effectiveness and other policy effects.

As illustrated in Fig. 1, participants first received an introduction text and video about climate change and EU and national climate policy prior to their evaluation and selection of preferred policy options. After their selection, citizens provided written arguments for or against policy options and could propose alternative suggestions, followed by a survey to evaluate the PVE. The policy options were divided across the five mitigation sectors to align with the National Climate Agreement. Furthermore, the PVE results needed to be finished in time for the national elections in May 2021, serving to gain political support for citizen engagement, alongside another report that recommended the establishment of a citizens' assembly (Brenninkmeijer et al. 2021). The preferred set of policy options that citizens selected were aggregated, resulting in a percentage of citizens that are for or against each policy option (Mouter et al. 2021d). The PVE researchers also collected all written arguments for and against each policy option and performed a qualitative analysis to distil the key most often recurring normative principles for public support for ambitious climate policy: (1) policies that personally affect citizens are only acceptable if climate measures to large polluters are visually taken, (2) protect citizens with lower incomes, (3) the polluter pays and (4) benefits of policy options should outweigh the costs. In contrast to the ICA, the PVE was not institutionally embedded in the policymaking process. Nevertheless, the report was presented to Members of Parliament and handed over to the coordinator of the National Climate Agreement. This coordinator presented it to the Minister of Economics

and Climate in an official letter and commented that the report was 'highly relevant to politics'. PVE researchers also presented the results to members of Parliament. As of September 2023, concrete policy outcomes of the PVE are less clear compared to the ICA, but the four key principles were highlighted in various media (Supplementary Information F), reflected in policy debates (interviews 13, 14) and used by lobbyists (interview 15). In a parliamentary debate in November 2022, the Minster of Climate promised to consider the four principles in upcoming climate policymaking. Moreover, in March 2023, the Ministry of Climate and Economic Affairs officially administered another PVE on climate policy..

In the following sections, we first present a reconstruction of the processes of opening up and closing down of climate policy options in the ICA and PVE (Sect. 6), followed by a detailed dramaturgical analysis of how the setting, scripting and staging of expertise in each case and shaped these dynamics of opening up and closing down (Sect. 7).

6 Comparison of dynamics of opening-up and closing-down the possibility space

As schematically illustrated in Fig. 2, we observed that in both cases the possibility space was gradually closed down throughout the phases, yet in contrasting ways. The Irish government tasked the ICA with the open policy question: 'How the State can make Ireland a leader in tackling climate change'. In contrast, PVE participants were faced with a much narrower framing and specific goal, namely how the Netherlands could cut 55% emissions by 2030 compared to 1990, which already shaped the types of policies that were relevant. In both cases, the possibility space was further shaped by the choice to focus on specific mitigation sectors (interview 8; Mouter et al. 2021d). A stark difference between the cases is that where PVE participants could only choose between 10 policy options that were preselected by PVE researchers and policymakers, expert witnesses in the ICA

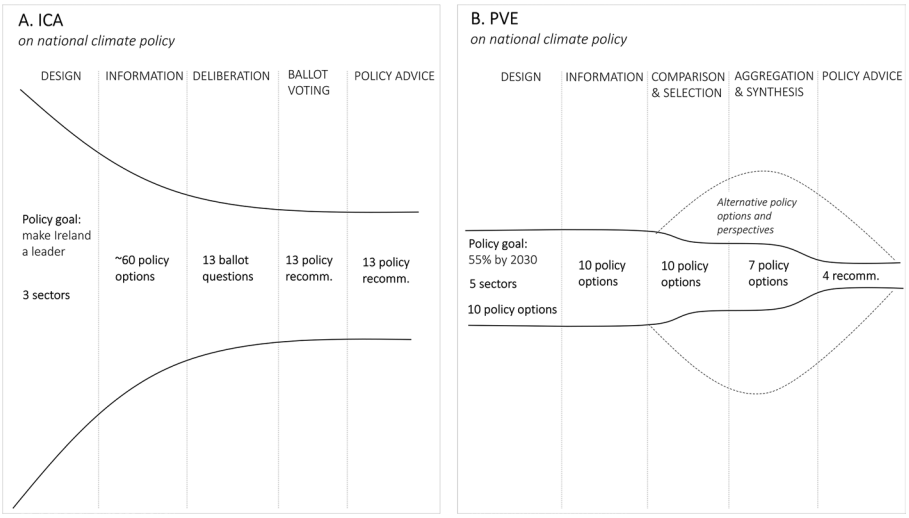


Fig. 2 Schematic illustration of the processes of opening-up and closing-down of the possibility space in both cases

identified approximately 60 policy options (see supplementary data).[6] Despite the limited set of options, participants in the PVE could freely propose policy suggestions in an open question after their comparison, resulting in radical policy proposals such as granting legal rights to nature and decreasing child benefits (Mouter et al. 2021d). A sample of the additional ideas and policy proposals that citizens proposed was also included in the report, but not in the key conclusions as PVE researchers faced difficulties assessing inclusion criteria (hence indicated as a dotted line in Fig. 2). In contrast, although citizens in the ICA were able to propose alternative policy options beyond the ones presented by experts, in practice, all citizens' recommendations reflected the policy proposals that experts suggested (supplementary data; see also Muradova et al. 2020). All 13 recommendations on the ballot reached a majority of votes of at least 80%, which was the highest across all five topics (Devaney et al. 2019). In the PVE, citizens' preferences were aggregated resulting in 7 policy options that were preferred by most participants (50% < in both open and sample PVE, Supplementary Information B). The report included four key recommendations (Sect. 5.2).

7 Comparison of scripting, setting and staging of expertise

In this section, we compare how the scripted roles of experts (7.1) and the particular setting and staging of expertise (7.2) affected the dynamics of opening up and closing down.

7.1 Scripted roles of experts in the ICA and PVE

7.1.1 ICA

A Secretariat consisting of civil servants was assigned to develop the work programme, oversee the process and write the final report. The ICA involved two types of experts, each with different scripted roles: (1) expert witnesses that would provide presentations and answer questions during the information phase and (2) an Expert Advisory Group (EAG) consisting of six experts with expertise on designing deliberative processes as well as climate experts from diverse disciplines (The Citizens' Assembly 2018; Supplementary Information E). The two scripted roles of the latter were 'process designers', as the EAG assisted the Secretariat in designing the programme and selecting expert witnesses as well as 'technical assistants', assisting Assembly members in assessing the technical feasibility of policy options when drafting the ballot questions (The Citizens' Assembly 2018).[7] Citizens could provide feedback on the information programme during its design. Nevertheless, design choices such as the focus on specific sectors influenced citizens' deliberative space:

'There wasn't that holistic looking at the system that would contribute to the climate crisis. It looked just at different sectors. […] There was just a very narrow lens and there

[6] Policy options that were provided textually by experts in their papers and slides or orally during their presentations were counted. This is an estimated number of policy options, taking into account the possibility of double counting.

[7] The names of 'process designers' and 'technical assistants' were not named as such in the report but identified here based on their responsibilities.

wasn't room for creativity, innovation or radical alternatives' (interview 11, Assembly Member).

Moreover, although the EAG was instructed to operate as technical assistants, the interviews suggest that they took a more influential role as 'recommendation formulator'. The Assembly members could propose initial topics in the first weekend, followed by iterative drafts by the Secretariat and EAG and feedback by Assembly members in order to ensure citizens 'took ownership of the ballot' (The Citizens' Assembly 2018, p. 12). However, our interviews suggested that experts played a more significant role:

'It was certainly a collaboration between the citizens and the Expert Advisory Group but I would say the Expert Advisory Group raised the bulk of the recommendations that were voted upon in reality.' (interview 10, EAG member).

The 15 expert witnesses included 9 researchers from scientific institutes and governmental agencies and 6 'advocates championing low-carbon transitions', such as a representative of a local energy community initiative, a firefighter who initiated the first carbon neutral fire station and a social enterprise tackling food waste (Devaney et al. 2019, p. 6). The ICA thus involved diverse types of experts, including process experts on designing deliberative processes, technical and scientific climate experts, policy experts and experiential expertise on initiating on-the-ground initiatives (see Supplementary Information E). Assembly members found the provided information understandable, balanced and of high quality (Supplementary Information A.4). However, both experts and citizens found two weekends highly insufficient given its complexity (interviews 3, 4, 7, 8). Due to time limitations, only a small set of experts could be involved for each sector and the limited amount of experts therefore largely influenced the outcomes:

'citizens have limited time to be informed or to get informed. Inevitably who you ask to do the informing does have an influence on the outcomes.' (interview 2, expert witness).

'[the recommendations] very much reflected the information that we had been told.' (interview 11, Assembly Member).

Although citizens could propose expert witnesses, some of which were indeed invited (interview 8, Secretary), the majority of expert witnesses were selected by the EAG based on a number of criteria (The Citizens' Assembly 2018, p. 54). Moreover, although the expert witnesses were instructed to act as 'honest brokers', providing a range of policy options (see supplementary data file), they sometimes stepped out of this role and acted more like 'issue advocates', strongly advocating for specific policy options (cf. Pielke 2007). Examples of issue advocates include a highly respected economist who strongly emphasised carbon taxation in his presentation (interviews 2, 7, EAG members) and a mobility expert who strongly argued for investment in public transport during a Q&A session (video Q&A session 1, September 30, 2017). Our interviews and analysis of proposed policy options suggest that options that were either strongly advocated by experts or presented by multiple experts were likely to end up in citizens' recommendations (Supplementary Information C), which is in line with findings by Muradova et al. (2020).

7.1.2 PVE

The PVE also involved two types of experts with different scripted roles: (1) a team of PVE researchers (led by author 2), including experts on designing the PVE and climate experts (Supplementary Information E) who coordinated the PVE design and developed the report, and (2) external climate experts who provided feedback on the policy options and effect representing various disciplinary fields (see Supplementary Information E). Similar to the

EAG in the ICA, the PVE researchers were thus involved as 'process designers', with an even stronger influence on the design as they were also coordinating the process. Designing the content and parameters of the PVE, including defining the quantitative target, government budget constraints, policy options and the information on policy effects (such as costs, effectiveness, health and biodiversity) involved an iterative process between PVE researchers, policymakers, policy advisors and external experts to ensure both policy relevance and credibility (see Supplementary Information F for a timeline). Compared to the ICA, the PVE involved less diverse types of expertise, only scientific experts and no experiential experts (Supplementary Information E). The selection of the final 10 policy options was further informed by five mitigation sectors in the Netherlands (PBL Environmental Assessment Agency 2019) and a special government report on the effectiveness of policy options to achieve the 55% emissions target (Van Geest 2021). Where the EAG in the ICA only implicitly framed citizens' deliberations through the design of the information programme, PVE researchers shaped the possibility space more explicitly by preselecting 10 policy options. This limited set of options was the most often mentioned negative aspect of the PVE by citizens ($N = 148$), commenting for instance that they were 'steering too much'. Apart from the design, PVE researchers also had a significant role in formulating policy recommendations. Out of all alternative policy options that citizens suggested, the researchers selected a small sample to be presented in the final report (Mouter et al. 2021d). The selection was aimed to demonstrate citizens' creative capacity to identify 'out-of-the box' proposals. Moreover, the PVE researchers also aggregated citizens' preferences into percentages of support for each policy option and analysed 2000 of participants' responses to identify recurring arguments for and against policy options which they synthesised into key guiding principles (Mouter et al. 2021d). In other words, PVE researchers essentially closed-down the diverse perspectives of more than 10,000 citizens into four principles.

7.2 Setting and staging of expertise in the ICA and PVE

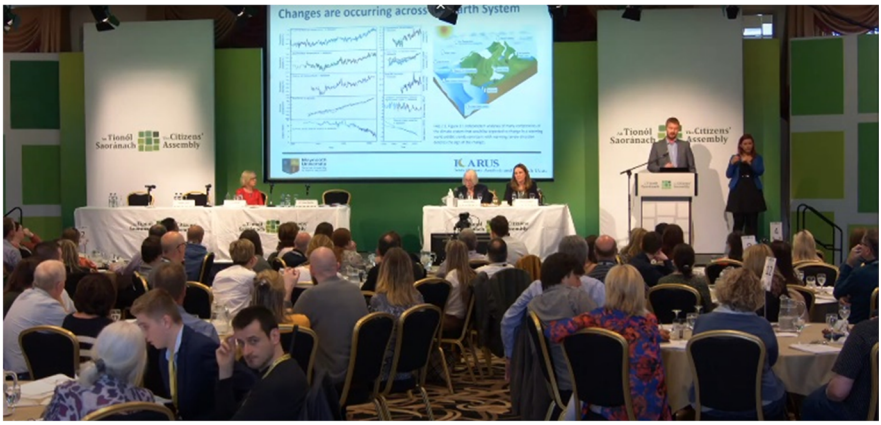
7.2.1 ICA

The ICA took place in the formal setting of a conference room, enabling face-to-face interactions between experts and citizens. As indicated by the video material, when experts spoke, they stood on a pedestal and citizens were placed at small roundtables (Fig. 3A). During expert presentations, this setting may have casted citizens as passive recipients of knowledge provided by experts. Although citizens could ask questions during the Q&A sessions, the experts were still on the podium. This privileged position of experts may have hampered citizens' ability to critically scrutinise experts' claims and introduce alternative policy options to those experts suggested in their presentations. Although citizens occasionally introduced alternative policy options, such as incentivising seaweed production as an alternative to animal protein, citizens predominantly asked experts for clarification (videos of Q&A sessions of first weekend). As an expert witness noted: 'citizens didn't come up with their own ideas' (interview 6). Instead, citizens asked experts to make recommendations:

'a lot of the time, we were sort of asking the experts: tell us what to advise, we don't know enough on this. Please tell us what recommendations we need to make because you are the experts and we are complete novices to this.' (interview 11, Assembly members).

This tendency of citizens may have been enhanced through the particular staging of expertise, as the Chair introduced expert witnesses as 'explainers' of causes and solution

A.



B.

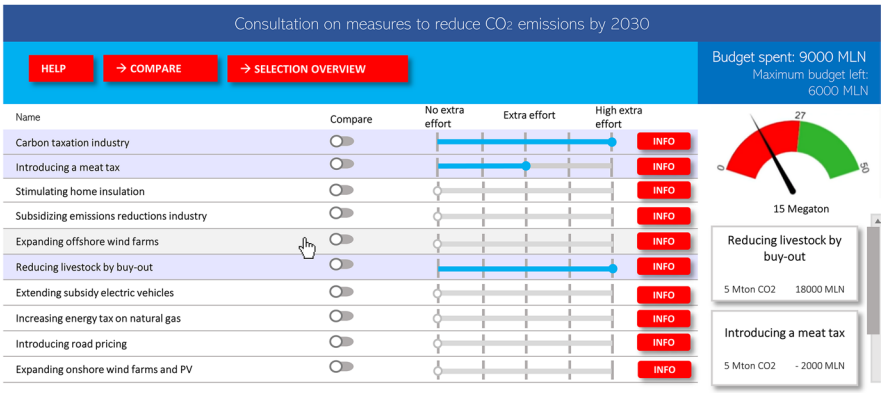


Fig. 3 Physical setting of the ICA (**A**) and the PVE (**B**)

orientations of climate change, highlighting their leading positions in authoritative scientific institutes and policy councils (opening speech and introduction of experts by the Chair).

7.2.2 PVE

In contrast to the ICA, in the PVE, the setting was an individualised engagement with an online interactive tool where citizens evaluated a small set of policy options towards a quantified emissions target and a constrained budget presented on the screen (see Fig. 3B). The setting of a relatively simple online tool allowed large groups of citizens to participate. However, only a limited set of policy options could be evaluated, which strongly predefines the possibility space and also prevents citizens from interacting with experts or critically scrutinise expertise. The expertise was presented as a number of quantitative and qualitative policy effects (Supplementary Information A.3). The expert-based policy effects were staged as non-negotiable facts, e.g. 'building off-shore wind creates job opportunities', 'road pricing will reduce commuting time and improve reliability', with links to several authoritative reports such as those by the Netherlands Environmental Assessment Agency

(PBL). This fact-like presentation of expertise and the absence of a personified expert may have created a form of 'mechanical objectivity' (cf. Hilgartner 2000), which may close-down citizens' diverse perspectives on desirable policy options. Moreover, this mechanical objectivity risks masking the explicit choices that PVE researchers made in selecting policy options and judgments of relevant policy effects.

8 Discussion

In this section, we reflect upon the theoretical and practical implications of our two key findings (8.1 and 8.2) and propose recommendations for future research and practices of citizen engagement (8.3).

8.1 Experts' prominent roles in shaping the outcomes of citizen engagement practices

A key finding of our research was that expert involvement largely shaped the process and outcomes of both cases. Experts not only provided information, but made critical design choices which framed citizens' deliberations and had significant roles in formulating the recommendations (see Sect. 7.1). This finding is in line with earlier empirical work on the Irish and French climate assemblies on climate change (Courant 2020; Muradova et al. 2020; Giraudet et al. 2022) but it contrasts findings of the UK climate assembly, in which expert information was only marginally discussed (Elstub et al. 2021). Although research on expert involvement in other PVE cases is lacking, PVE researchers typically have a strong coordinating role, defining the scripted roles of external experts and the presentation of expertise (see e.g. Mouter et al. 2021a, b, c, d). It should be noted that design choices were not only made by experts, but also by government officials, who often set the boundaries such as the choice of the policy question (as illustrated in Fig. 2). The policy question varies across recent climate assemblies, from a specified quantitative target (e.g. France, UK) to a more open question (e.g. Ireland, Germany, Scotland). Another factor that may have shaped the outcomes is that the ICA was more formally embedded compared to the PVE. A stronger institutional embeddedness may enhance citizens' willingness to push for alternative options. Time constraints may also influence the outcomes, potentially intensifying experts' influence. In the ICA for instance, only a few experts could be involved which enhanced the influence of individual experts. More time could have limited this influence. The French and UK climate assemblies for instance involved seven and six weekends respectively and citizens were assigned to different working groups to ensure sufficient time for each topic. However, in the French citizens' assembly, experts still significantly influenced the outcomes (Courant 2020; Giraudet et al. 2022). In the UK climate assembly, experts' influence remains unclear, but the report on this assembly indicates that the information provided by experts was only marginally discussed during the small-group deliberations (Elstub et al. 2021). It therefore remains unclear to what extent time could be a mediating factor.

Altogether, it can be concluded that experts significantly shape the outcomes of citizen engagement practices in national climate mitigation policy. This may not necessarily be problematic. More informed opinions are even viewed as a desirable outcome according to deliberative democracy theorists. It becomes problematic however if policy recommendations are presented as citizens' own identified ideas whereas in reality these reflected

experts' proposals. These risks may not be limited to the issue of climate change, but more generally reiterate that strong involvement of experts makes citizen engagement processes susceptible to manipulation (Böker and Elstub 2015; Roberts et al. 2020). Presumably such risks are particularly lurking in environmental issues, which are typically characterised by complex socio-technical interactions, various uncertainties and long-term policy effects. These characteristics imply a strong involvement of scientific and technical experts, as opposed to for example gay marriage and abortion. More generally, our findings call into question the promise of citizen engagement practices to 'open-up' policy debates (cf. Fiorino 1990; Stirling 2008). According to Stirling (2008), closing-down means assisting incumbent policymakers by highlighting a small courses of action, as opposed to opening-up of how courses of action appear preferable under a wide range of perspectives. Both dynamics were at play. On the one hand, both cases showed a gradual closing-down towards a small set of recommendations (see Fig. 2). On the other hand, despite the small set of preselected policy options, the PVE opened up new normative principles that Dutch policymakers were not fully aware of (interviews 13–15). Likewise, despite the small set of recommendations in the ICA, some of the recommendations were highly controversial. In other words, it matters *what* is opened up (policy options or normative perspectives) and *compared to what* (e.g. incumbent policymakers or experts' identified possible policy options).

8.2 Dramaturgies of expertise and dynamics of opening-up and closing-down

A second key finding of our comparative analysis was that the particular setting, staging and scripting of experts and expertise affected the dynamics of opening up and closing down of the possibility space. In both cases, two types of expert roles could be identified: (1) *embedded experts* (PVE researchers/the EAG), who were involved in the design of the process as well as formulating recommendations, and (2) *external experts* (externally consulted experts/expert witnesses) that were only involved in the information phase and acted as 'honest brokers' (Pielke 2007), who identified a range of policy options and effects. (see Sect. 7.1). Most national climate assemblies so far involve embedded experts in the form of an expert advisory panel that makes design choices and assists citizens in formulating ballot questions (see KNOCA 2022 for overview). Earlier empirical work already stressed the critical role of such a panel (Lightbody and Roberts 2019; Roberts et al. 2020). In earlier PVE cases, embedded experts also typically have a coordinating role in the design of the PVE and formulating the recommendations (see e.g. Mouter et al. 2021a, b, c, d), except one case where citizens could both define the policy options and recommendations themselves (Itten and Mouter 2022). With regard to the external experts, on the one hand, one could argue that experts 'opened up' citizens' deliberations by identifying options that citizens were presumably not previously aware of. On the other hand, our analysis of the ICA shows that citizens did not identify options themselves and experts sometimes forcefully communicated options, which is in line with earlier research on the Irish and French climate assemblies (Courant 2020; Muradova et al. 2020; Giraudet et al. 2022). The latter may have been enforced by putting experts in a privileged spot (setting) and emphasising their authoritative roles (staging), which emphasises the boundary between experts and non-experts. Although research on different room set-ups across citizens' assemblies is lacking, plenary expert presentations seems common practice across national climate assemblies so far (KNOCA 2022 for an overview). In the PVE, case citizens' deliberations were more clearly closed down: although experts (both

embedded and external) presented a range of options and effects as honest brokers, the fact-like staging of expertise risks masking their preselection of a small set of options.

A different scripting, setting and staging may have resulted in different dynamics of opening up and closing down. Instead of presenting specific options, experts could for example provide more general solution-orientations, such as in the climate assembly in Austria where experts provided a number of 'leverage points' for citizens to brainstorm on policy options (KNOCA 2022). This may reduce the risk of experts' forceful communication of policy options. A different room set-up may also limit experts' influential role, such as in the UK climate assembly where experts and citizens deliberated in small groups, allowing for a more reciprocal dialogue (Elstub et al. 2021). Experts may also be staged as 'enablers' or 'participants' rather than 'informers' (Lightbody and Roberts, (2019) to stimulate citizens' capacity to identify alternatives. With regard to the PVE, the setting of an online tool is necessarily limited to a small range of options to ensure its accessibility to a large public. Nevertheless, citizens could have been enabled to select 10 out of 100 options for example, followed by more detailed evaluations. Moreover, a less fact-like staging may counteract experts' influence, such as in a recent PVE application to the future Dutch energy system where citizens divide points to a number of normative principles with more generalised effects.

8.3 Limitations and recommendations for future research and practice

Our research involved various biases and limitations, most notably in case study selection. Our findings regarding the significance of expert involvement more generally (8.1) is in line with earlier empirical work and the scripted roles (8.2) are relatively similar to other PVE and climate assembly cases. However, as noted by Lightbody and Roberts (2019), expert involvement is highly diverse among deliberative mini-publics, let alone other forms of participation. We therefore recommend that future research further investigates how a different setting and staging of experts and expertise influences citizens' recommendations across more PVE and citizens' assembly cases. We also recommend the investigation of a more diverse set of citizen engagement practices, including for instance also citizens' juries, collaborative governance and participatory budgeting, given that expert involvement is highly diverse (Lightbody and Roberts 2019). Given that similar dynamics may be at play at other environmental issues, future research may expand its focus beyond climate change. Our research also only superficially engaged with the different types of expertise (e.g. scientific vs. experiential expertise), which may have different effects on the opening up and closing down of policy options. For example, Muradova et al. (2020) observed different communication styles between different types of expert witnesses in the ICA. Moreover, our dramaturgical analysis was limited to experts only, whereas the scripting and staging of citizens and government officials could also have influenced the outcomes. For example, whether citizens are staged as advocates of societal interests, 'innocent' citizens with open minds or lay experts matters for how expert-citizen interactions play out (cf. Irwin 2006).

Methodological limitations could also have influenced our results. The personal involvement of authors 1 and 2 may have biased the results of the PVE, for instance by overlooking design choices such as framing of the problem resulting from their own expertise or neglecting critical choices made in formulating policy recommendations (see also Sect. 4). The personal involvement also implied different methods between the two cases, which may have resulted in an unequal comparison (e.g. more diverse perspectives in the ICA

compared to the PVE due to a larger number of interviews). Moreover, our data was too limited to separate the influence of the setting, staging of expertise, the types of experts and expertise or external influences on citizens' deliberations.

Our research also revealed some practical considerations for organising participatory processes. First and foremost, organisers should carefully consider the goal of engaging citizens (e.g. identifying normative perspectives or policy options) and adjust the appropriate setting (e.g. deliberative or online) as well as the scripted roles of experts accordingly (see Sect. 8.2). This goal may vary between issues and scales. Given the complexity and required technical knowledge in national climate mitigation policy, the strength of engaging citizens in this particular issue might not be identifying specific policy options, but rather to provide some normative principles that guide climate policymaking (see e.g. the German climate assembly). In contrast, addressing a local environmental issue may require citizens' local knowledge to identify solutions. Apart from the scale and issue, the goal of citizen engagement may also depend on the policy phase, e.g. agenda-setting or implementation (cf. Wells et al. 2021). Secondly, in a deliberative setting, experts could physically be put in a less privileged spot, allowing for a more interactive and equal dialogue (cf. Roberts et al. 2020; Elstub et al. 2021). Third, citizens could be tasked with a narrower topic, which allows for the inclusion of a larger number and more diverse types of experts and thereby reduces the influence of views of individual experts (cf. Lightbody and Roberts 2019). A narrower topic may also be more tangible and less cognitively overloading for citizens, which can support their creative capacity to identify policy options. In the case of climate mitigation, this might mean focusing on a specific mitigation sector. Fourth, to limit the exclusionary expert framing, citizens' agency in the selection of experts and expertise could be enhanced (cf. Roberts et al. 2020; Itten and Mouter 2022). Risks of the latter might be that relevant forms of expertise are excluded from the process and only publicly known experts become involved.

9 Conclusion

We compared two contrasting cases of citizen engagement in climate policymaking to better understand the role of experts and expertise. In both cases, expert involvement largely influenced the outcomes. Experts not only provided information but had diverse roles in the design and formulating recommendations. Our research is limited to only two cases and our findings need to be confirmed by investigating a larger number of cases across countries, participation methods and issues. Nevertheless, it can be concluded that expert involvement is a critical dimension to consider when designing citizen engagement practices, especially in issues with a high level of socio-technical complexity and required scientific and technical knowledge such as climate policy. We found that the particular setting, staging and scripting of experts and expertise can result in different dynamics of opening up and closing down. Where a citizens' assembly allows for a larger range of policy options to be scrutinised and deeper engagement with expertise, the online PVE method allows for insights into more diverse normative perspectives as a much larger number of citizens can participate. Citizens' deliberations are further shaped by the particular scripted roles of experts and staging of expertise. Organisers of citizen engagement processes should therefore carefully consider *what* should be opened-up (policy options or normative perspectives), by *whom* (citizens or experts) and *how* (scripted roles and staging of expertise). These choices may depend on the scale, complexity and phase of the policy issue.

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Data Availability Most data generated during and/or analysed during the current study can be found in the Supplementary Material. The data gathered regarding the policy options that were proposed by experts in the Irish Citizens' Assembly are not publicly available due to identifyable information but are available from the corresponding author on reasonable request.

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