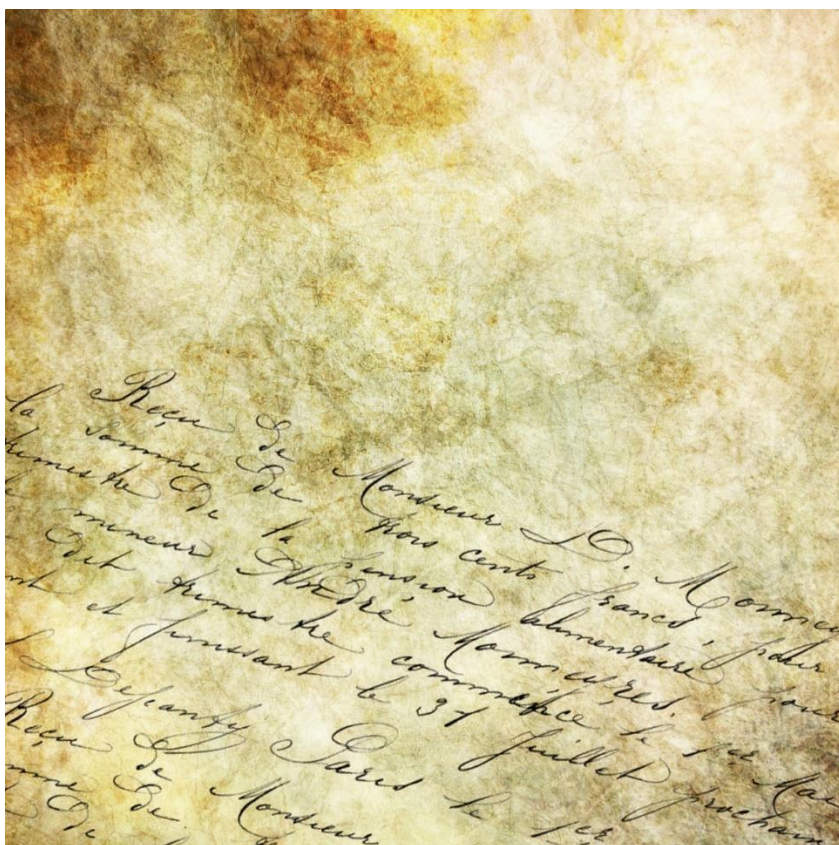




Report

Policy-ready recommendations



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ECHOES Report

Policy-ready recommendations

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AUTHORS:

Christian A. Klöckner, Jed Cohen, Johannes Reichl, Andrea Kollmann, Valeriya Azarova, Giuseppe Carrus, Parissa Chokrai, Immo Fritsche, Torsten Masson, Angelo Panno, Lorenza Tiberio, Stepan Vesely, Alina Mia Udall, Gudrun Lettmayer, Dorian Frieden, Kurt Könighofer, Izaskun Jimenez, Lucía Polo, Daniela Velte, Elena Dimitrova, Milena Tasheva-Petrova, Angel Burov, Irina Mutafchiiska, Lassi Similä, Suvisanna Correia, Tiina Koljonen, Mehmet Efe Biresselioglu, Muhittin Hakan Demir, Dragomir Tzanev

Quality assurance:

Christian Klöckner, Tiina Koljonen

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ABSTRACT

This report represents the final output of the ECHOES project as it pertains to energy policy and regulation in Europe. The goal of the report is to distil the myriad research activities that took place in ECHOES, across three conceptual levels, three technological foci, and various scientific disciplines, down into their most relevant and clear policy-relevant conclusions. This culminates in a list of policy recommendations that are meant to make policymakers aware of vital considerations in consumer behaviour that impact policy efficacy, as well as identify some specific items that inform future policy applications in the energy sector.

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POLICY BRIEF

ECHOES Policy Recommendations:

Reduce Complexity, Improve Knowledge Management, Frame Policy Action

The ECHOES research project was designed to understand the energy behaviour of European citizens in order to improve the uptake, acceptance, and impact of energy-related policies and motivate participation in the transition to a low-carbon energy system. Within the massive data collection and analysis effort of ECHOES across 31 European countries, multiple scientific disciplines, and three conceptual levels, one takeaway finding resonates throughout: **There is no-one-size-fits-all approach to energy and climate policy and consumer behaviour.** Individuals across Europe exhibit highly varied energy views, attitudes and behaviour, and consequently will react very differently to energy policy and regulation, often with surprising effects.

For policymakers and regulators in the energy domain this diversity implies that a high level of understanding is required in energy policies that attempt to affect consumer behaviour. To navigate this potential complexity, **ECHOES offers three general policy recommendations** that can inform almost any consumer-oriented energy regulation scheme at any governance level:

- I. Reduce the regulatory, legal and procedural burdens for joining in energy programs and/or offer support to individuals and groups in navigating, applying for and interacting with the program(s).
- II. Build into energy programs standardized information and data collection tools and monitor the developments with selected key performance indicators (KPIs), including indicators for social effects (see e.g. Correia et al. (2019) for proposals); ensure that this information is available to individuals and actors in a way that allows them to understand their energy use and how it relates to the usage of others and market/environmental factors.
- III. Target policies towards specific collectives and groups of individuals with similar needs and characteristics, using the psychological levers identified in ECHOES to increase a group's uptake, support and acceptance of the policy (e.g. appealing to emotions, social identity and place attachment).

Implementing one or all of these recommendations into applicable energy policies and regulations has the potential to greatly improve the impact and acceptance of the new energy and climate policy and accelerate the transition to a low-carbon energy system, as clearly demonstrated by ECHOES research findings. To see more specific policy advice, interesting social insights in energy, and explore how socio-economic research can be used to improve energy policymaking, please read on.

EXECUTIVE SUMMARY

This report represents the final output of the ECHOES project as it pertains to energy policy and regulation in Europe. Energy policy in this case is considered in a broader sense including direct energy, climate-related, transport, and building policies. The goal of the report is to distil the myriad research activities that took place in ECHOES, across three conceptual levels, three technological foci, and various scientific disciplines, down into their most relevant and clear policy-relevant conclusions. This culminates in a list of policy recommendations that are meant to make policymakers aware of vital considerations in consumer behaviour that impact policy efficacy, as well as identify some specific items that inform future policy applications in the energy sector. The recommendations are empirically-validated, and their application to future policies related to consumer action in the energy sector should see higher uptake, participation and acceptance if these recommendations are put into practice.

These recommendations were constructed based off of the summarized ECHOES results presented in ECHOES Deliverable 7.1. The Deliverable 7.1 is a pre-cursor to this report and can be used to further substantiate and explain the methodologies and empirical results that lead to the policy recommendations. The recommendations were created through multiple rounds of inputs from all ECHOES partners, as well as workshops that also included external stakeholders.

To make these recommendations more useful to policymakers this report includes a substantial section of examples of how these policy recommendations can be, or are already, applied to EU, national and local energy policies from across Europe. These examples can be used as a starting point to craft future consumer-oriented policies in the energy sector. In particular, the recommendations are juxtaposed with the SET Plan, as ECHOES has the stated goal of informing the SET Plan with social science research. To further increase the exploitation of these recommendations the report offers a Policy Brief that encapsulates the three major considerations that impact consumer interaction with energy policies and can be applied to improve nearly any energy policy across any level of governance.

Past work in ECHOES (Deliverable 3.3) has identified some deficiencies in current energy and climate-related policies and regulations from across Europe in regards to the representation of energy market actors within the policy. These actors' motivations and decision making processes are too often oversimplified – which hinders the uptake and acceptance of the policy. This is encapsulated in the overarching ECHOES conclusion that there is no valid one-size-fits-all policy approach. Thus, ECHOES prescribes that a more holistic approach to understanding consumer groups be adopted in future policies and that this understanding be grounded in empirical social science research.

Table of Contents

POLICY BRIEF	4
EXECUTIVE SUMMARY	5
1. INTRODUCTION	7
1.1 ECHOES objectives and main activities of the project	7
1.2 Relation of the ECHOES recommendations to EU policies	8
1.2.1 The SET Plan	8
1.2.2 Clean energy for all Europeans	9
2. POLICY RECOMMENDATIONS	10
2.1 Scope of recommendations	10
2.2 ECHOES general policy advice	10
2.3 ECHOES policy recommendations	11
3. EXAMPLE APPLICATIONS OF THE POLICY RECOMMENDATIONS	26
3.1 EU policy examples	26
3.1.1 Directive on the promotion of the use of energy from renewable sources	26
3.1.2 Directive on common rules for the internal market for electricity	27
3.2 National and local examples	28
4. CLOSING REMARKS	37
4.1 Exploitation of ECHOES policy recommendations	37
4.2 Conclusion	38
5. REFERENCES	40

1. INTRODUCTION

1.1 ECHOES objectives and main activities of the project

The overarching objective of ECHOES is to unlock the policy potential of an integrated social science perspective on energy behaviour. This includes socio-cultural, socio-economic, socio-political, and gender issues that influence individual and collective energy choices, as well as the social acceptance of the energy transition in Europe. Hereby, ECHOES contributes to fostering the implementation of the SET (Strategic Energy Technologies) Plan and the advance of the EU's low-carbon energy transition.

One of the four strategic objectives identified for the ECHOES project is to elaborate policy-ready recommendations from the wealth of social science data and knowledge created within the project. These recommendations can have a major impact on European, national, and regional policymaking in the energy sector, if they are used to help to adjust the design of respective programmes and measures. ECHOES studied the energy choices and behaviours of three distinct decision making groups: individuals, informal collectives, and formal social units (e.g. companies). The recommendations are thus targeted towards policies and regulations in the energy sector that interact with at least one of these three decision-making bodies. The goal is to make such new policies and regulations more impactful, increasing participation in the energy transition and improving actors' acceptance of energy system changes.

Aiming to reach its other key objective of identifying and quantifying the driving factors behind energy choices and behaviour, ECHOES scientific findings are based on multi-disciplinary research activities involving specialists in psychology, sociology, political science, statistics, engineering and economics. These groups worked together, to comprehensively foster understanding of the cross-cutting issues related to socioeconomic, gender, sociocultural, and socio-political aspects of the energy transition. Such a multi-disciplinary approach allows ECHOES to conduct a targeted investigation of the three levels of energy decision making namely micro, meso, and macro levels. To cover a substantial portion of energy related choices, ECHOES aimed to examine behaviour, choices and preferences as well as the key drivers behind them in the three technological foci areas: smart energy technology, electric mobility and buildings.

The main research activities conducted in ECHOES to reach the projects' main objectives included: an extensive literature review, qualitative and quantitative data collection methodologies including policy reviews, meta-analyses, case studies, interviews and focus groups, psychological studies (experiments and correlational surveys), a netnography study, and an international survey with choice experiment conducted across 31 European countries. A detailed description of the major activities and respective results and conclusions are provided in Pons-Seres de Brauwier et al. (2019).

This report is a further step towards delivering the objectives of ECHOES. The aim of the present report is to advance a set of policy-prescriptive recommendations and strategies tackling individuals' acceptance, engagement, and acceptance with energy policy measures and instruments advancing the Energy Union and SET-Plan.

This deliverable is based on the work conducted in all the ECHOES work packages and distils the scientific results into policy-ready recommendations in each technological focus and sub-categories of these technologies, serving as a bridge between scientific theory and results and the real life application thereof. Thus, the key objective of this report is to provide theoretically sound and empirically supported recommendations to policymakers about how to best design energy policies and programmes to achieve high impact, and how to increase their acceptance among the European citizens. To reach this goal all research activities conducted in ECHOES were analysed with respect to their policy relevant conclusions and results, which are summarized in Pons-Seres de Brauwier et al. (2019).

Multiple rounds of input was solicited from each of ECHOES partners and external stakeholders including two workshops that are presented in detail in Cohen et al. (2019c), and an additional internal workshop that took place alongside the ECHOES Final Conference in Trondheim, Norway, in September 2019. Workshops and external input were used to tune the recommendations and decide at which level and to which technological focus the respective finding can be best implemented. This allows to strengthen the impact of ECHOES findings and reinforce their relevance for both national, local and EU level policy making.

The applicability and usefulness of these policy recommendations is further strengthened by the inclusion of numerous example cases from local, national and EU level energy policies. Some of these examples are positive, showing how existing policies already include ECHOES recommendations into their language and execution. Other examples illustrate areas for improvements in existing policies and regulations, where social science best practices are not adequately reflected. The previous ECHOES report of Klöckner et al. (2018) analysed over 100 energy-related policy documents from EU, national and regional levels, and concluded that while consumer concerns are represented in many of these documents, the employed concepts of decision-making and behavior are oversimplified; often decision-making of energy actors is reflected only in information provision/deficits and conceptualising all decisions as a rational cost-benefit optimization process. ECHOES findings and the policy recommendations herein will allow for a richer and more holistic understanding of energy decisions to be reflected in policy documents.

In the following section, we reflect on the relevance of elaborated recommendations for the SET Plan and Clean energy for all Europeans package. The two represent essential EU-level policy initiatives that aim to facilitate the energy transition to a sustainable, low-carbon, integrated system. Section 2.1 then clarifies the scope of the policy recommendations and how they can be applied by policymakers and regulators across Europe. While the short-list of universally applicable ECHOES policy recommendations is provided in the Policy Brief, the detailed list of recommendations based on scientific findings collected in the ECHOES is given in Section 2.3 of this deliverable. Further on, examples of implementation of ECHOES recommendation on EU, local, and national levels are provided, followed by a brief discussion of impacts and identification of future social science research activities going beyond the scope of ECHOES' work that would serve to deepen the policy recommendations given here.

1.2 Relation of the ECHOES recommendations to EU policies

1.2.1 The SET Plan

The European Strategic Energy Technology Plan (SET Plan) is a key initiative aiming to “boost the transition towards a climate neutral energy system through the development of low-carbon technologies in a fast and cost-competitive way”¹. This aim should be reached by improving new technologies and bringing down costs through coordinated national research efforts. Facilitation of cooperation among EU countries, research institutions, and private companies is considered another key step towards energy transition on one hand and European leadership in development of innovation technologies and market solutions on the other.

Following the tenth year anniversary of the SET Plan in 2017, the European Commission published a progress report which was updated in 2019². Following this report it is noted that while major achievements and improvements have been made in the energy system there are still challenges ahead. Some of the goals that still should be targeted in a more active way include accelerating the development of low-carbon technologies, improving the competitiveness of innovative energy technologies and solutions, a greater focus on implementation of big projects and project bundles with more participation from private companies. Furthermore, mobilisation of public and private resources in a coordinated and targeted way (focusing on concrete activities), is suggested to

¹ <https://ec.europa.eu/energy/en/topics/technology-and-innovation/strategic-energy-technology-plan>

² https://setis.ec.europa.eu/sites/default/files/setis%20reports/2017_set_plan_progress_report_0.pdf

be the SET Plan's center for the upcoming years, which is especially relevant for ECHOES findings. This goal is in unison with one of the ECHOES policy recommendations which suggests implementing targeted procedures for stakeholder engagement at the local and national levels to adapt plans and programmes to the specific needs of stakeholders, and more generally as ECHOES recommendations are geared towards increasing the participation and market acceptance of actors with new energy programs.

In order to strengthen the mobilization of the public and private resources, which should take a central role in the SET Plan implementation, a solid understating of drivers behind energy-related decisions on various levels from micro to macro entities is required to increase the impact of energy campaigns and policy measures. Some of the policy recommendation elaborated in ECHOES state that including gender- and context-specific decision-making factors in design of policy campaigns can increase their efficiency. This again underlines the importance of framing and tailoring of the campaigns by taking into account not only socio-demographics but also psychological factors including norms and social identity.

Another way in which ECHOES conclusions contribute to further implementation of the SET plan is by highlighting the necessity to boost synergy not only between researchers and industry, but also between researchers and policy makers. One of the ECHOES policy recommendations in this respect requires in funding schemes that policy experts are part of the research consortia and suggests provision of policy trainings to researchers. Such an increased collaboration between scientific and regulatory worlds could enrich significantly the outcomes on both sides and broaden the outlook in the long-term. It would allow for improving the results of innovative research projects, and also allow for a better understanding of policy needs/goals among scientists, who in their turn will be able to provide better and clearer empirical basis to support and, if necessary, adjust policy measures.

1.2.2 Clean Energy for All Europeans

The 'Clean Energy for All Europeans' package is another major EU legislative initiative on the way to energy transitions. It is made up of eight legislative acts, covering energy efficiency, renewable energy, electricity market design, governance rules for the Energy Union, energy security and eco-design. Additionally, the Commission outlines how it wishes to support innovation in the energy sector including both the uptake of existing technology, as well as how to support innovation to advance new technologies. Innovative solutions and new business models, information provision, new technologies for decentralised production, as well as expected development and uptake of energy storage and smart metering are also supported in the package allowing increased transparency and better regulation giving a more active role to consumers as participants of the energy system. Initially proposed in 2016 as a set of new ambitious rules aiming to contribute to energy transition, Clean Energy for All Europeans package, was completed in 2019 when the four remaining elements of the package were formally adopted. EU countries have 1-2 years to transpose the new directives into national law. So ECHOES recommendations can be used in this context by national authorities to translate the measures required to be adopted by the European Commission's directive, while taking into account formulations, and auxiliary considerations outlined in section 2 that will ensure a higher acceptance and a higher efficacy of the regulations.

Considering that consumers are in the heart of the Clean Energy for All Europeans directive, along with the 'energy efficiency first' principle. Consumers are suggested to be placed in the center of the new flexible energy system, so that they can take an active role in the energy system and more easily become energy producers as well, and sell excess energy into the market, without being subject to lengthy procedures and heavy charges, a better understanding of consumers' decision making drivers as well as clear strategy for specific framing and tailoring of information for groups of consumers is required. ECHOES findings in this context provide an important support for policymakers allowing to tweak the suggested measures based on data.

2. POLICY RECOMMENDATIONS

2.1 Scope of recommendations

The recommendations given in section 2.2 below stem from the ECHOES research on the energy choices and behaviours of various market actors that is summarized in Pons-Seres de Brauwer et al. (2019). As such, all of the recommendations are meant to apply to policies and regulations that interact with market actors. A particular strength of the recommendations is in their application to new or existing policies and regulations that require direct participation from market actors, or policies that may suffer from a lack of social acceptance. The recommendations can improve the impact of such policies by fostering higher levels of participation and acceptance.

It is important to state explicitly the intended application of the policy recommendations. The recommendations are **not** given as an exact language to be adopted directly into law and regulation, e.g. “write a directive that says xyz”. Instead they constitute advice on which aspects of agent behaviour to consider or highlight to a greater extent when crafting a policy, and how behavioural levers can be used to create more impactful policies. Some of the policies are generalizable to many different energy contexts and topics, while others are specific to a given technology or a specific issue that policy may address. ECHOES research focused on the technologies in smart energy, electric mobility, and buildings – thus many recommendations come out of empirical work that dealt specifically with these technological foci. Technology-specific recommendations are given under the headers of the technology topic, or subtopic in section 2.3. The general recommendations that can be applied to many technologies and sectors in energy are given in section 2.3, subheading A.

Finally, in an effort to make the social science-based policy recommendations more accessible to policymakers we have distilled the findings even further into three pieces of general policy advice, given in section 2.2 and in the ECHOES Policy Brief. The advice given in section 2.2 may be applicable to any policy involving energy market actors – and these recommendations are seen as critical over-arching considerations that will greatly impact the success and impact of the policy as it pertains to consumers.

The policy recommendations are valid for various level of government, including EU, local, regional and national levels. The section 2.2 general advice is valid for all levels of government entities, while the more specific policy recommendations in section 2.3 can be valid for only one, or multiple levels. The valid levels of government is generally noted within the recommendation or in the paragraphs below which explain and substantiate the recommendation.

2.2 ECHOES general policy advice

For policymakers and regulators in the energy domain the diversity of consumer preferences and heterogeneity of European regions implies that a high level of understanding is required in energy policies that attempt to affect consumer behavior. To navigate this potential complexity, ECHOES offers three general policy recommendations that can inform and improve almost any consumer-oriented energy regulation scheme at any governance level:

- I. Reduce the regulatory, legal and procedural burdens for joining in energy programs and/or offer support to individuals and groups in navigating, applying for and interacting with the program(s).
- II. Build into energy programs standardized information and data collection tools and monitor the developments with selected key performance indicators (KPIs), including indicators for social effects (see e.g. Correia et al. (2019) for proposals); ensure that this information is available to individuals and

actors in a way that allows them to understand their energy use and how it relates to the usage of others and market/environmental factors

- III. Target policies towards specific collectives and groups of individuals with similar needs and characteristics, using the psychological levers identified in ECHOES to increase a group's uptake, support and acceptance of the policy.

Implementing one or all of these recommendations into applicable energy policies and regulations has the potential to greatly improve the impact and acceptance of the new policy and accelerate the transition to a low-carbon energy system, as is demonstrated by ECHOES research findings summarized in Pons-Seres de Brauwer et al. (2019).

In terms of implementing the ECHOES advice in point II, the report of Correia et al. (2019) gives an overview of available and promising KPIs that relate to individual and collective energy choices and monitoring the social impacts on consumers. The selected indicators in the report are relevant to the objectives of the SET Plan and other complementary topics being developed in current energy policy debates. Secondly, many of these indicators could be informed – or even calculated – through the information contained in the ECHOES database, which includes various national-level social indicators with respect to energy attitudes, behaviours, and intentions from an international survey across 31 European nations and 18,000 respondents, among other data sources.

The ECHOES advice in point III above can be implemented using results found throughout ECHOES reports, but is most highly concentrated in Carrus et al. (2019b), where the identified psychological levers affecting consumer behaviors in energy are identified. In this report, marketing and appealing to people's and collectives' psychology and self-identity is shown to have a strong influence on their propensity to take sustainable energy action.

The potential juxtaposition when comparing general takeaways II and III is noted. While standardization, as in II, helps to overcome some of the barriers that arise from conflicting regulations, accepting diversity in solutions is also necessary to address regional/cultural peculiarities, as in III. ECHOES points out that higher order policy (country level, EU level, etc.) should avoid prescribing concrete solutions in too much detail, but rather define frameworks and that allow for lower level (e.g. regional and municipal) policymakers and regulators to tailor the policy implementation to their target groups, as under III. Along these lines, when 'harmonization' is discussed in the specific policy recommendations in Section 2.3, it is taken to mean that higher-level (national, EU) policies don't supersede, overcomplicate, or conflict with the lower level (regional or local) ones. 'Standardization', as discussed in Section 2.3, is meant in the spirit of point II, as a suggestion to standardize the measurement tools and available information coming out of policies (e.g. one program measuring success in kW solar capacity installed and another measuring success in kWh produced/year leads to confusion and a lack of coordination between the two programs). This is distinct to how the policy is marketed/framed (e.g. in solar adoption as an environmental action or as an investment), which should be culture and target-group specific as under point III.

2.3 ECHOES policy recommendations

This section gives the full list of ECHOES policy-ready recommendations. These recommendations are given under the technological foci categories of ECHOES, or sub-categories thereof – with the exception of heading A, which gives recommendations that are applicable to multiple areas of energy policy.

Each recommendation is given by first referencing the ECHOES empirically-based conclusion that leads to the recommendation. Following the recommendation box, the recommendation is further explained and substantiated by relating it to ECHOES research activities. For more information about the methods and results that lead to these conclusions readers are suggested to see Pons-Seres de Brauwer et al. (2019), which has the same sub-headers as the recommendations below with corresponding information contained in each sub-headers.

A. Energy policy

A.1.

ECHOES Conclusion:

Paths to reaching climate and energy goals have to be identified through collaborative processes taking into account the varied conditions facing Member States, collectives, and individuals.

Policy recommendation:

Implement procedures for stakeholder engagement at the local and national levels to adapt plans and programmes to the specific needs of stakeholders.

The on-size-fits-all approach to policymaking is inappropriate. Specific paths to reaching common climate and energy goals have to be defined through collaborative processes, taking into account varying conditions. A major example of this from ECHOES is the elaboration of energy lifestyles in Schwarzing et al. (2019), which showed that there are at least six distinct ways of households interacting with and using energy that exist in Europe. Considering, the 'average citizen' within a policy framework is then a severely limited strategy, as it does not account for the fundamentally different ways that people use energy, and the areas of energy usage where a given group has a high potential to increase efficiency. Developing then a collaborative process that accepts input from these various lifestyle groups and the other distinct stakeholders defined in ECHOES (e.g. formal social units) will result in more impactful policy implementation.

A.2.

ECHOES Conclusion:

EU policy needs to have a high level of abstraction but this leads to lower level policy being unspecific.

Policy recommendation:

Make a best practice collection of selected lower level policy part of the high-level policies, thus stimulating specificity on the lower levels.

Whereas EU level documents naturally lack specificity, the top-down approach makes it likely that lower level documents just copy the unspecific higher-level assumptions. Therefore, EU level documents should be supplemented with a best practice collection of local level policy, which shows how the general policy could be implemented. This approach will help with the implementation and transposition of EU frameworks onto the national/local levels. Policies should distinguish between different levels of social groups and their interactions more clearly by indicating which measure is targeting which unit and why. Some example policies that implement best practices in regards to energy behaviour are given in section 3 of this report.

A.3.

ECHOES Conclusion:

Advice by social scientists is often not given in a policy-compatible form.

Policy recommendation:

Require in funding schemes that policy experts are part of the research consortia. Provide policy trainings to researchers. Create arenas for policymakers to engage more with social scientists.

Social scientists need to develop the ability to provide clear advice. To be relevant, the state-of-the-art needs to be accessible in a policy compatible way, not as scientific theory. Scientists and policymakers need "exchange arenas" for collaboration and mutual learning, they need opportunities to create understanding. Therefore, invite representatives of the policy-side to internal workshops. This could be personal meetings (preferentially) and virtual meetings (video conferences). This personal participation should be made administratively easier for policymakers by keeping the workshops targeted on gaining their specific inputs into well-defined topics and, where possible, accommodating their schedules and providing funding for their travels. In research projects with a policy focus, reserving funds for policy representatives to participate in workshops should be obligatory.

A.4.

ECHOES Conclusion:

The roles and responsibilities of different levels of administration and policymaking are not clearly defined which leads to unnecessary conflicts between policy measures and/or implementation actions.

Policy recommendation:

For development and implementation of energy policies, clear responsibilities need to be assigned to the different government levels and administrations; these responsibilities need to be revised regularly.

Specific administrative roles/functions should be clearly defined and attributed to the relevant institutions at different levels of governance, and communication/exchange between the responsible levels of governance (municipal or local, provincial, national) should take place in order to get widely accepted solutions that fit into practice. In other words, a streamlined system of distribution of jurisdiction and extent of competence should be clearly established and maintained regularly in order to maximise efficiency and avoid unnecessary duplication. In the Austrian case, for example, municipalities are strongly interested in implementing their own e-car ideas and in receiving external funding for these ideas from provincial and/or state-level institutions. The upper administrative level "province" perceives itself as an executive body of politics but has the leeway to design the desired activities/programs in terms of content. The Bulgarian experience with housing renovations is another example of the challenges of pathways for different government entities to work together (Carrus et al., 2019a).

A.5.

ECHOES Conclusion:

Unpredictable changes in policy contribute to regulatory risk and reduce the willingness of citizens and companies to invest resources into energy improvements.

Policy recommendation:

Ensure stability of regulatory frameworks with medium-long term programs, and processes of bureaucratic deregulation and stabilization of financial incentives for individuals and firms.

This recommendation is relevant to any energy program that requires an investment on the part of individuals or groups. In such energy investments (e.g. photovoltaic adoption), risk of policy change is shown to be a negative factor in actors participation in incentive programs (Cohen et al., 2019b). Giving such policies a set-term and expiration date as they are created will mitigate this problem as it makes the lifetime of the policy a *known* factor, thereby reducing risk of unknown futures.

A.6.

ECHOES Conclusion:

Specific factors were found to have impact on decision-making and energy-related behaviour of man and women. While in some contexts (public transport update) no differences were found, in others (community investment, donation, private car travel choices) major differences were indicated.

Policy recommendation:

Include gender- and context-specific decision-making factors in design of policy campaigns to increase their efficiency.

The gender perspective plays an important role in energy-related decisions, but it is still not thoroughly investigated and as a result not taken into account in many policies. In ECHOES work, the gender dimension in energy behavior was investigated as a central construct of interest across all studies of energy choices (Cohen et al., 2019, section 4.4). For example, in the Meta-analysis of Masson et al. (2017), the somewhat surprising result was that emotions such as pride have a greater weight in energy savings decisions for men as compared to women. In contrast, identity, group membership and pro-environment attitudes are more prominent drivers of energy savings behaviours in women as opposed to men. "This would imply that men might be more successfully addressed by

campaigns or policies that make use of behaviour-specific emotional arguments, while women might be more effectively reached through campaigns or policies based on an overarching social identity focus (Masson et al., 2017, pg. 7)."

Another example can be found in the ECHOES work on e-mobility adoption. Men are shown to care more about branding, freedom, and the social status that comes with a particular e-mobility solution, while women care more about safety and functionality (range) issues (Biresselioglu, Kaplan and Yilmaz, 2018). These are issues of 'framing', how the policy is marketed and sold to the public and potential participants.

The suggestions of ECHOES is that targeted framing be used to address target groups. For example, if women are currently under-represented in an aspect of the energy transition (e.g. energy financing), then framing a policy using the levers identified above would recommend that the new energy financing program link participants together, for example via local meetings, to give the participants a social identity that comes out of participating in the energy financing program.

A.7.

ECHOES Conclusion:

Framing of policies with respect to their target groups is important. For instance, there are differences in what appeals to men/women and younger/older people.

Policy recommendation:

Policy instruments should be sensitive to the psychology and needs of the target group(s). This needs to be implemented in the process of shaping, framing, and marketing the policy to the public.

Empathy strategies and more participatory approaches to policy design should be considered in order to trigger certain emotions that help shape/form desirable behaviours and personal obligations for advancing a particular policy objective. Men might be more successfully addressed by campaigns or policies that make use of behaviour-specific emotional arguments, while women might be more effectively reached through campaigns or policies based on an overarching social identity focus. Likewise, the link between pro-environmental values and energy saving behaviour is stronger among younger people. Thus, value-driven appeals could be effective in campaigns targeting younger generations. These, and other, 'psychological levers' for successful policy framing are explored at length in Carrus et al. (2019b).

In the ECHOES international survey a real-incentive experiment of respondents' willingness to donate to fight climate change was conducted. The results showed how non-energy benefits of the fight against climate change were key motivators for people to donate. In particular, highlighting any local/regional economic or health benefits of new energy policies can improve participation and decrease opposition to the policy (Pons-Seres de Brauwert et al., 2019, pg. 36).

A.8.

ECHOES Conclusion:

The groups, and places that individuals identify with are strongly related to the sustainable energy actions that they might take.

Policy recommendation:

Carefully consider the framing of energy policies to account for the things, groups and places that people in the targeted group identify with.

Echoes studied identity related factors such as having aspects of the energy transition as part of ones personal identity (as a factor that is important for defining who a person is) or a place related identity (where the nature is considered part of the self) in their relation to energy choices in the trans-European survey. The methodology is fully explained in Carrus et al. (2019b). These factors were shown to have both direct and indirect effects on energy

decisions such as considering buying electric bikes: The more energy issues and the environment are part of a person's self-definition, the more likely it is that they consider investing in for example electric bikes. This effect can be partly explained by that they are more observant of societal norms that are in favor of such technologies and for other people already using the technology as models, as well as that they develop a feeling of moral obligation to act accordingly.

A.9.

ECHOES Conclusion:

The energy transition changes the roles, choices, and responsibilities of many types of actors.

Policy recommendation:

Develop training, financial support and guidelines for new policies to help actors adjust and deal with the consequences of their new role(s) in the energy system.

This recommendation is mostly based in equity/justice concerns, but can also impact the social acceptance of energy system changes (Cohen, Reichl, Schmidthaler, 2014). During the energy transition many actors may find themselves dis-empowered, or confused by their changing role within the system. This is especially apparent in interactions with smart energy technology, whereby households can become consumers, producers, storage units and demand-side managers of the energy system, which greatly broadens their previous role of only passive consumption (Biresselioglu, et al., 2017, pg. 56). Policy must recognize that decentralization of energy systems (especially when paired with mass electrification) produces new roles for actors across society, who willingly or unwillingly adopt new responsibilities in regards to their interaction with the energy system. A prominent example might be coal-miners, whose jobs are threatened by a transition to a low-carbon system. Policies then that promote the new energy system should be aware of the potential adverse effects, mitigate them through active training, and support campaigns. Stimulating and nurturing the people's new roles in a productive way through training, financial support and clear regulatory guidelines is recommended to avoid conflict and to improve the legitimacy and equity of the energy transition.

B. General policy using the concept of 'energy memories'

B.1.

ECHOES Conclusion:

Historic energy events shape a country's energy culture in the form of a shared energy memory, which then affects how new policy measures are contextualized.

Policy recommendation:

Energy policy on the local and national level needs to acknowledge the energy history of the region or nation and describe explicitly how the policy aims to incorporate the shared memory.

Incorporating the concept of "energy memories" in the creation of energy sector policy can make new policies more effective. Due to the added temporal dimension and the encompassing concept of energy cultures, the concept of energy memories serves as a useful element to make better sense of the historical development and inherited cultural configuration pertaining to material and norms-related actions. Policymakers should therefore strive to incorporate these attributes into policy interventions aiming to influence energy cultures via material and norms-related actions. If these policy measures introduce this new concept, there is a higher probability that policy interventions will be widely accepted (Lettmayer et al., 2018).

B.2.

ECHOES Conclusion:

Current events that impact the energy memories of a culture can also be an opportunity to push for changes in energy culture and energy policy.

Policy recommendation:

Monitor current events in the energy sector; assess options for leveraging the resulting changes in energy memory to advance policy goals.

Key events may also become the crucial point of targeted policy measures that take advantage of destabilised energy cultures in which the three components cognitive norms, material culture, and energy practices are no longer fully compatible. In practice, decision makers could utilise a ‘crack’ that forms in energy culture because of a major current event related to energy in order to advance the energy transition. This can be done by supporting a material culture in which the newly developed norms can result in more sustainable energy practices. It is essential to recognise societal developments and trends as early as possible and to understand the concepts of energy memories and energy cultures to be able to use opportunities to advance a low-carbon society (Lettmayer et al., 2018).

C. Electric mobility adoption

C.1.

ECHOES Conclusion:

Identifying oneself as being an environmentalist is an important driver for electric mobility adoption.

Policy recommendation:

As the environmental identity is important, e-mobility incentives should foster the possibility to express one's environmental identity, e.g. by making e-mobility identifiable (e.g., special number plates) or by outlining their environmental qualities.

Carrus et al. (2019b) explains in detail how a person's understanding of their own identity can strongly influence their intention to take sustainable energy actions. In the case of electric vehicles, this relationship was particularly strong in the case of one's identity as an environmentalist. Allowing adopters of e-mobility to strengthen this self-identity through highlighting the good as an environmental good can help to increase the uptake of e-mobility.

C.2.

ECHOES Conclusion:

E-mobility benefits and costs are balanced with benefits and costs of other activities in the city space.

Policy recommendation:

Require evaluation of all the consequences to the urban environment from uptake of e-mobility in the city (needed infrastructure, spaces, workplaces, health impacts, etc.).

This recommendation targets national level regulation related to electric mobility uptake, with the advice to require that subsequent state or city level electric mobility strategies carefully consider any technical restrictions. This recommendation is especially relevant to the case of personal electric cars, which require significant infrastructure for charging. Lack of charging infrastructure and poorly planned infrastructure is a significant barrier to e-mobility uptake (Biresselioglu, Kaplan and Yilmaz, 2018). Carefully evaluate all the consequences to the urban environment from uptake of e-mobility in the city will mitigate this risk in the medium-term planning of city and regional infrastructure.

C.3.

ECHOES Conclusion:

Consumers experience transportation as a system including more than individual cars. Thus, for e-mobility, electric cars alone cannot be the whole solution.

Policy recommendation:

Mobility plans of nations, regions and municipalities need to be systemic, including individual transport, public transport, e-bikes, electric light vehicles, and mobility services as well as their integration.

E-cars should not be the only focus in relation to e-mobility. The public transport system is one of considerable potential for contributing to low carbon and low emission transitions, e-bikes and electric light vehicles are also relevant, especially in combination with public transport options.

The strengths and limits of e-vehicles related to type of trips within the city and outside need to be clearly specified on the pathway of their adoption and technological improvement. The affordability of e-cars under specific local contexts should be made clear.

C.4.

ECHOES Conclusion:

Economic drivers are important for the decisions of individuals and groups to adopt e-mobility solutions. Upfront investment cost of e-mobility products is a particularly strong barrier to adoption.

Policy recommendation:

Identify what incentives and tax reductions can be tailored in each country to support e-mobility adoption, reducing upfront purchasing costs is preferred and relating these incentives to the uptake of photovoltaic generation may yield double benefits.

Upfront investment costs has been noted as one of, or perhaps the, largest barrier in adoption of e-mobility solutions by individuals and groups (Biresselioglu, Kaplan and Yilmaz, 2018). Thus, identifying which incentives and tax reductions can be tailored in each country to reduce this barrier can have a substantial impact on e-mobility uptake. Furthermore, ECHOES work has shown that the adoption of e-mobility can be linked to photovoltaic adoption due to the complementarity in using these technologies, e.g. charging an electric car during times of high solar production and thereby saving money (Cohen, et al., 2019a). There are multiple possibilities to take advantage of this fact in economic incentive programs for e-mobility. For instance, developing coordinated incentive structures for the joint adoption of e-mobility and photovoltaics is predicted to increase adoption of both goods. Another option is to require that information on programs for solar technology adoption be sent to people who sign up for a government e-mobility program and explain the complimentary benefits of both goods, this can yield double benefits and improve the impact of an e-mobility economic incentive.

C.5.

ECHOES Conclusion:

EV development and grid development are mutually dependent.

Policy recommendation:

Policy processes for smart grid development and EV development need to be integrated into one process.

Ensuring a smooth integration of electricity grid infrastructure and EVs charging systems that guarantees access to power when needed is important to stimulate adoption of EVs and trust in the technology, which are barriers to widespread adoption (Biresselioglu, Kaplan and Yilmaz, 2018). Policymakers need to address new electricity system challenges emerging from mass electrification of transport early in the process, and how to deal with massive new peak load issues – or the potential to alleviate grid problems through vehicle-to-grid concepts. This suggests actively working to merge strategies for implementing EVs with strategies for implementing smart grid technologies.

C.6.

ECHOES Conclusion:

E-mobility potentials and needs are highly diverse across different contexts.

Policy recommendation:

Incentives and programs for e-mobility in policy measures need to be developed and contextualized through collaborative stakeholder involvement.

Policies should strive to facilitate or incentivise a more collaborative approach to e-mobility, whereby public and private stakeholders exchange visions and develop a shared/common trajectory for the implementation of electric

vehicles. For example, dialogue with independent small private e-car sharing enterprises should be initiated, yet acknowledging that e-car sharing in non-urban communities is only accepted under certain spatial and infrastructure conditions. Therefore, policies incentivising e-car sharing uptake should have clearly differentiated approaches depending on the geographic distribution of their target populations (e.g. different incentive structures for rural and urban populations).

C.7.

ECHOES Conclusion:

Household adoption of energy technologies are linked decisions. In particular, households with solar units are much more likely to adopt electric vehicles.

Policy recommendation:

This suggests the possibility for double dividends, whereby promoting PV adoption also promotes the adoption of electric vehicles de facto. This double dividend should be taken into account when considering policy cost-benefit analyses of new PV or e-mobility incentive policies.

Household adoption decisions regarding EVs are shown to be linked to their environmental attitudes and their ownership of solar power units. Households with solar power units are much more likely to consider EV adoption (21% more likely than a non-solar household based on Austrian data), likely due to their ability to use solar power to charge their EV and the increased awareness of energy issues that comes with owning a solar unit. (Cohen et al., 2019a)

D. Sustainable public transport and travel mode choices

D.1.

ECHOES Conclusion:

Successful and adaptive urban planning accepted by the population requires participatory approaches and feedback mechanisms.

Policy recommendation:

Local policies should embrace participatory approaches towards mobility planning and give opportunities for user feedback.

Development and implementation of participatory mobility planning approaches and planning documents on urban development and public transport should be integrated into the urban planning process in the mobility sector. Citizens are in-touch with their travel needs everyday, and thus changes to infrastructure can be met with a large-degree of social opposition; an active participatory approach can help mitigating this. Enhancing the dialogue among local authorities, experts, citizens, users, and transport service providers should be the goal of this approach. Request consistent user feedback on public transport regarding comfort, timeliness, accessibility, adequacy, and quality in order to guarantee reliability and attractiveness and keep public transport as a valid travel mode option as it competes with new solutions (e.g. e-scooters).

D.2.

ECHOES Conclusion:

Mobility plans need to adapt to changing situations, cultures, and contexts. This requires tight monitoring and frequent evaluation.

Policy recommendation:

Develop monitoring systems and evaluation criteria / indicators for the performance of intermodal transport.

Development of monitoring and evaluation mechanisms and relevant indicators is needed. This can be supported by the ECHOES decision tree algorithm in D6.5 (Biresselioglu and Demir, 2019). Indicators should take aspects of intermodality and using multiple modes of transport per trip into consideration, as well as the limits of public transport

and its compatibility with other mobility modes (incl. individual e-car/bike and light EV options, sharing and demand responsive services with EV fleet), especially for trip chains and door-to-door accessibility.

When possible these indicators should consider the variety of groups served by mobility. For instance, physical characteristics of the areas served (e.g. density, size and city layout), and family/demographic characteristics will strongly drive mobility choices, as shown by the energy lifestyles elicitation in D5.1. As such, lower-middle class family households in lifestyle group 5 have strongly different mobility usage and subsequent environmental impacts than the singles or couples represented in lifestyle group 4 (Schwarzinger et al., 2019).

In terms of indicators and goals for the success of the a sustainable transition in the mobility sector, D2.3 proposes the market share of electric passenger vehicles, the number of electric vehicle charging points, and the percentage of electrified railways vs. conventional railways, can be used to assess progress in this transition (Correia et al., 2019).

D.3.

ECHOES Conclusion:

Per-ticket fees are preferred by most citizens, including users of public transit, as opposed to monthly tax increases when it comes to raising money for 'greenification' of public transportation.

Policy recommendation:

Increase ticket prices for ridership instead of increases to general taxes to raise money for public transit to improve the societal acceptance of the price increase.

If a fee structure is needed to raise money for local transportation improvements, such as increased sustainability, citizens will generally be more accepting of increases to ridership ticket prices compared to a monthly tax that hits all citizens. This is likely due to the increased flexibility in terms of paying the increased costs (e.g. substituting away from public transport), and the incremental nature of payments (Pons-Seres de Brauer et al., 2019, pg. 53).

E. Smart energy technologies

E.1.

ECHOES Conclusion:

Many policies and regulations can make it difficult for energy suppliers to adopt or test new demand-side management possibilities.

Policy recommendation:

Develop clear guidelines on the usage and protection of energy demand data, e.g. from smart meters, for a region or nation.

There is a strong need for a more holistic approach in this domain to allow for full utilization of smart energy technology. Public policies and regulations need to be more helpful to allow energy companies to test new demand-side technologies. In many cases, new technologies on the demand side of the energy grid are not being implemented due to legal and procedural risks faced by energy companies including data-protection concerns and the requirement to only contact customers through pre-approved channels (Holzleitner, 2018). It should be stressed that the testing of demand-side management technology be cognizant of the issues regarding trust and social acceptance of new technology. In this regard, field tests of such technologies would do well to employ pre-, post-survey design analysed by social scientists to assess any negative effects on trust and acceptance from the new technology.

E.2.

ECHOES Conclusion:

The concept of smart energy technology is fuzzy and still largely undefined, which results in problems with setting clear decision-making processes.

Policy recommendation:

Provide a clear definition of different categories of smart energy technology and create protocols for different categories of these technologies within new policy initiatives.

There is a lack of a clear definition for the term “smart energy technology”. Different actors identify smart energy technology differently. This undermines the decision-making process of policymakers and their communication with entrepreneurs and local communities/individual. These technologies should therefore be promoted with clearer communication channels. This is predicted to improve the uptake and impact of smart energy technologies (Biresselioglu et al., 2017).

E.3.

ECHOES Conclusion:

The feedback to consumers about their energy consumption does not usually match their decision-making processes and interests.

Policy recommendation:

Develop energy consumption feedback systems that provide feedback in a user-friendly way, when it is needed and where it is needed, in a way that motivates the targeted consumer and matches their needs.

Smart energy technology can be used to provide consumers information about their energy consumption, such as the case of smart meters that can forward detailed electricity consumption information to households. The current problem is that this information is not readily-available to the consumer, and when it is available it is not presented in the most impactful way. ECHOES results points to feedback mechanisms that contextualize the energy information within social/personal norms, and self-identification, and ancillary benefits – such as pro-environmental or economic repercussions of a given consumption pattern (Biresselioglu et al., 2017; Carrus et al., 2019b).

Social science research, such as that done in ECHOES, points to motivators in regards to the behavioural effects of understanding one’s own energy consumption in a collective context. The results of the ECHOES meta-analysis showed that in-group collective efficacy beliefs are the strongest motivators of taking sustainable energy actions (Carrus et al., 2019b, pg. 54). Thus, promoting motivators that are relevant within a given nation, and relate to the ability of that nation to really make a difference in the fight against an environmental challenge will improve the efficacy of the energy consumption and energy efficiency policies. Within people, these beliefs increase the chances of a person taking energy efficiency actions due to beliefs that their actions have consequences are seen as positive by their peers.

F. Choice and awareness of low-carbon electricity purchase options

F.1.

ECHOES Conclusion:

Market regulations can impact the availability, attractiveness of low-carbon electricity contracts, and consumers’ awareness of such options.

Policy recommendation:

Ensure that the electricity market structure resulting from new policy will support low-carbon or ‘green’ electricity retail packages and require that information concerning the availability of these packages is distributed to consumers.

As noted in Biresselioglu et al. (2018), there are significant differences between European nations as to the availability and awareness of low-carbon electricity retail packages. These are options where an electricity customer

has an option to pay a different tariff to ensure that a larger proportion of their electricity is generated by preferred sources (e.g. regional or renewable sources). This heterogeneity is driven, at least in part, by the market dynamics and energy portfolios within each nation. Thus, the recommendation is that future policies and regulation of the electricity market take this issue into account and try to ensure that low-carbon electricity options are available. As a second step, the existence of low-carbon electricity purchase options as viable alternatives needs to be disseminated to consumers. New policies should thus design methods for the diffusion of information concerning the sources of electricity available for purchase.

G. Individual adoption of energy self-consumption and prosumersim

G.1.

ECHOES Conclusion:

Lack of available funding is a key barrier for uptake of small-scale renewable energy capacity.

Policy recommendation:

Providing micro-funding schemes for small-scale renewable energy capacity is of key importance for households and smaller organizations in order to sustain the uptake of renewable generation.

Despite the various social-psychological levers identified in ECHOES and in this document, financial concerns and return-on-investment remain as a major driver of small-scale RES uptake. To sustain the transition to a distributed renewable energy system requires that some funding and incentive schemes remain in place. These schemes may be most impactful if they decrease the initial investment cost of the RES installation. Decreasing the risk associated with market changes in electricity prices is also shown to increase uptake. Finally, these incentive programs should not create regulatory risk – the payouts of the program should be well-defined and not subject to change on short notice (Cohen et al., 2019a; 2019b).

Augmenting new funding mechanisms with the identified social insights may increase their effectiveness. For instance, stressing the pro-environmental aspects of renewable energy and any benefits to the region, e.g. in the form of increased jobs and cleaner air, can nudge people towards adoption (Pons-Seres de Brauwert et al., 2019, pg. 43-45).

G.2.

ECHOES Conclusion:

Non-compliance between regulatory frameworks hinders investment in renewable energy.

Policy recommendation:

Harmonize different regulatory frameworks and ensure compliance between national, regional, and local policies in terms of funding, incentives, regulations.

If policymakers want to support greater adoption of RES by private citizens, firms, and companies the procedural aspects of becoming a prosumer must be clear and simple. Inconsistent and complex regulatory regimes were noted by individuals, firms, and SMEs to require specialized expertise to navigate in many cases, which made them inaccessible to many potential users (Saether et al., 2018).

Specifically, clearer, simplified, and streamlined legislation and administrative procedures must be established: harmonizing different regulatory frameworks and ensuring compliance between national, regional, and local policies in terms of funding, incentives, and regulations will greatly help in this process (Biresselioglu et al., 2017).

H. Collective investment and ownership schemes of renewable energy installations

H.1.

ECHOES Conclusion:

Long processing times for applications and lengthy or confusing regulatory/legal processes hinder collective investments in renewable energy.

Policy recommendation:

- Introduce streamlined and simplified procedures for a speedy handling of applications and cases.
- Provide legal support to consumers for understanding and addressing the administrative and market barriers (i.e. collective investment and ownership schemes) and supporting collective stakeholders through information provision and skills training.

Reducing procedural complexity can increase uptake and participation in collective energy programs. As with other technologies, ECHOES data consistently points to the problems faced by individuals and collectives when they are confronted with heavy administrative and bureaucratic/legal burdens and lengthy processes when attempting to interact with new policy schemes (Pons-Seres de Brauwer et al., 2019, pg. 44). This can be accomplished with a two-pronged approach. The first part being to reduce the complexity of the procedural process upfront whenever possible, with the goal of making it easy for people to participate in the new program and reduce the legal and administrative risks they face.

The second part of the recommendation is to provide legal support to consumers and collective entities for understanding and addressing the administrative and market barriers they will encounter when implementing a collective action with renewable energy. Supporting collective stakeholders through information provision and skills training can be a key enabling factor for collective action. For example, retailers offering renewable energy or energy cooperatives could lead and enable these initiatives by offering guidance and support to otherwise inexperienced neighbours or groups of consumers. They could have a key role in facing the challenge that bureaucratic burdens pose for those groups and overcoming the obstacles of the distribution companies.

H.2.

ECHOES Conclusion:

The urgency of the energy transition and concrete steps that can be taken by the relevant individual and collective actors are not well-known to these actors.

Policy recommendation:

Increase awareness for the need to accelerate the transition to more sustainable energy lifestyles and practices, among individuals, and self-organized collectives and representatives of formalized agencies, and companies. Concretely, the possibilities to engage in energy cooperatives to produce renewable energy should be better advertised and disseminated across European nations.

In many cases, there is a knowledge gap in terms of the awareness for the need to accelerate the transition to more sustainable energy lifestyles and practices, among individuals, self-organized informal collectives and representatives of formalized agencies, and companies (Saether et al., 2018). In particular, it is difficult for many individuals and leaders to identify which concrete actions they can take to participate in the energy transition. This case is clear in the ECHOES work on renewable energy communities that shows a high interest in joining such communities and yet this social innovation has only taken off so far in Denmark and Germany (Pons-Seres de Brauwer et al., 2019, pgs. 45-46). This points to a clear need for further communication and spreading of trustworthy and applicable schemes in renewable energy communities – in practice this could be accomplished by an expansion of the REScoop initiative that focuses intensively on nations with underdeveloped energy cooperative markets.

H.3.

ECHOES Conclusion:

The municipal level is considered an important field of action for the renewable energy uptake. Joint public-private investments in renewables at the local level are a way to overcome resistance to renewable energy projects or to

accelerate the drive to renewables. Non-economic remuneration or rewards can also serve to mobilise citizen investment.

Policy recommendation:

Local or regional renewable energy investment initiatives should include frameworks that stimulate the participation of private citizens in the projects through public-private partnership.

Stimulating and creating participation is essential for creating trust between actors and decreasing local opposition to local energy projects (Cohen, Reichl, Schmidthaler, 2014). The key point here is that giving citizens the opportunity to directly participate in large-scale projects can help the project to be more impactful (e.g. more funds raised), and decrease the chance of social issues and local opposition that result from the project. Still, as mentioned, in point H.7 below, the ECHOES international survey data clearly showed that individuals prefer to participate in collective renewable investments that are administered by non-governmental community groups – thus, increasing the capacity and effectiveness is preferred.

H.4.

ECHOES Conclusion:

A clear regulation offering legal stability and avoiding the use of different criteria by different electricity distribution companies is missing – this hinders the uptake of shared self-consumption schemes.

Policy recommendation:

Standardize the requirements of electricity distribution companies to enable collectively-owned installations and avoid discriminatory grid access.

For shared self-consumption systems, several factors have been identified to stabilise and boost collective action. Among them is the need for a clear regulation offering legal stability and avoiding the use of different criteria by different electricity distribution companies. There is a need to standardize the requirements of electricity distribution companies to legalise collectively-owned installations and avoid discriminatory situations to grid access (Saether et al., 2018).

H.5.

ECHOES Conclusion:

The rules for measuring and billing shared self-consumption are unclear causing uncertainty and slowing social innovation in collective energy resources.

Policy recommendation:

Define clear rules on how to measure and bill shared self-consumption, and a regulatory framework that enables the sharing of energy amongst prosumers and consumers.

Clear rules on how to measure and bill shared self-consumption collectives are needed, as well as a regulatory framework allowing and enabling to share the energy surplus among consumers. Clarity and accessibility on these issues would allow actors to innovate and try new business models.

H.6.

ECHOES Conclusion:

Funding schemes other than the national programs are often unknown to the target groups.

Policy recommendation:

Consider targeted efforts or the creation of long-term strategies that raise public awareness and understanding of active funding schemes for energy efficiency and RES measures.

Substantial proportions of the public are often unaware of local and regional funding schemes for energy efficiency and RES measures. Raising public awareness and understanding about active funding schemes for energy efficiency and RES-based measures, above and in addition to national level grant programs, which are often more highly-visible, will make these programs more impactful. Examples of long-term strategies for increasing public

utilization of smaller-scale incentive schemes includes the creation of a specific office or entity with these actions in their mission statement. One prominent example of such is the Finnish Motiva Ltd. Office, which is a state-owned company that promotes energy efficiency and sustainable practices through campaigns and delivering information.

H.7.

ECHOES Conclusion:

Significant funds may be available from citizen participation in energy cooperatives.

Policy recommendation:

- Increase the trustworthiness of energy cooperative opportunities through e.g. deposit insurance and guaranteeing minimum payback rates.
- Increase the visibility of energy cooperative investment opportunities through targeted campaigns and the creation and support of non-governmental community organizations.

ECHOES estimates that at least €176 billion of untapped funds exists in the form of citizens' willingness to participate in local wind energy cooperatives across the EU-28. These cooperatives schemes have only taken off so far in Denmark and Germany; other nations have underdeveloped markets with very few options being presented to individuals. Increasing the trustworthiness and visibility of energy cooperative investment opportunities will help to put these funds towards to energy transition.

Citizens prefer energy cooperatives that are set up and administered by non-governmental community groups. Helping to create and train such groups in administering energy cooperatives (see point H.1 above) will increase participation in energy cooperative investment opportunities (Pons-Seres de Brauwer et al., 2019, pg. 45-46).

I. Renovations for energy efficiency (i.e. retrofits) and heating & cooling

I.1.

ECHOES Conclusion:

Unclear legal and tax requirements for housing can hamper improvements in energy efficiency.

Policy recommendation:

Provide clear legal and tax information for housing companies.

The building sector is heavily regulated and the steering system is inflexible; this does not encourage decision-makers to test novel options for improving energy efficiency. In buildings, investment and operating costs are the major guiding factor in decisions; second is the convenience, easy maintenance and reliability of systems, environmental goals are generally lower in the hierarchy.

Policies must provide targeted and clarifying information on the legal status of housing companies, especially with respect to the issue of taxation and financial regulation of investments of money handles by such organizations (Saether et al., 2018).

I.2.

ECHOES Conclusion:

The effects of renovated buildings can be enhanced by undertaking public awareness campaigns to reduce energy consumption by introducing smart solutions, changing appliances with ones of a higher energy class, and explaining the financial mechanisms for implementing follow-up measures. Continual work on changing people's mind-sets and awareness is of key importance.

Policy recommendation:

Make the assessment of the interaction between building and users a mandatory part of energy efficiency upgrade plans in the renovation phase.

The effects of renovated buildings can be enhanced by undertaking public awareness campaigns to reduce energy consumption by introducing smart solutions, changing appliances with ones of a higher energy class, and explaining the financial mechanisms for implementing follow-up measures. Continual work on changing people's mind-sets and awareness is of key importance (Carrus et al., 2019a).

I.3.

ECHOES Conclusion:

There is a need to ensure the sustainability of the energy efficiency measures funded by public programmes to maintain and protect achievements, organize energy audits, and manage co-housing properties.

Policy recommendation:

Homeowners who get public funding for energy efficiency measures should be required to provide post-funding feedback regarding the effect of the energy efficiency measures taken. This post-funding feedback should be part of an obligatory monitoring scheme that is based on methods provided by the authority.

There is a need to ensure the effectiveness of the energy efficiency measures undertaken under the programmes – to maintain and protect achievements, organize energy audits, and manage the condominium property in general; homeowners' obligations in return to the funding support should be also regulated in the normative documents in the ways described in Carrus et al. (2019a).

I.4.

ECHOES Conclusion:

Municipalities expect incentives and methodological support from the national and regional level entities in building renovation procedures.

Policy recommendation:

National and regional authorities should provide incentives and methodological support to local authorities in a simple and accessible form.

Municipalities expect incentives and methodological support from the national and regional levels. This allows local governments to fill a critical role in the uptake of energy efficiency renovations in buildings. Namely, the municipalities provide examples of successful projects, supply information on the renovation process and its costs, and provide access to technical, legal and consulting experts (Pons-Seres de Brauer et al., 2019, pg. 55-56).

I.5.

ECHOES Conclusion:

All associated private and civil society stakeholders should be involved in a building renovation process to guarantee its reach and impact.

Policy recommendation:

Define mandatory collaborative procedures in the regulations for the energy transition regarding energy efficiency renovations in buildings.

Collaborative approaches are especially important in the case of large-scale energy efficiency renovations in multi-use or multi-stakeholder buildings. Case studies and in-depth interview completed in ECHOES exhibited this fact in the case of an Italian co-housing project, and a Bulgarian housing cooperative. In the Italian case, an inclusive participatory approach is identified as one of the main motivators of success of the energy efficiency renovation in this case (Carrus et al., 2019a, pg. 19). Moreover, this participatory approach to regulation needs to be engaged *before* the regulation process ends, ensuring that people feel included and that their use cases and ideas are taken into account throughout all phases.

In the Bulgarian case, a cooperation of multi-family buildings was developed through a homeowners association to jointly renovate these buildings with energy efficiency measures. This required a cooperative approach from the onset, as even joining the project was a group decision. The individuals who formed this association were motivated to band together by the opportunity for renovations that are more impactful and a sharing of the bureaucratic burdens required to realize such investments. The adequate participation of all members of the homeowners association was aided greatly by the existence of streamlined regulations and regulatory processes (Carrus et al., 2019a, pg. 47). These two cases clearly illustrate the importance of all private and civil society stakeholders should be involved in the regulatory reform process to guarantee its reach and impact.

3. EXAMPLE APPLICATIONS OF THE POLICY RECOMMENDATIONS

3.1 EU policy examples

In this section, examples of ECHOES recommendations applied to EU level policy are provided, we include articles of the two directives of the Clean Energy for all Europeans package: directive on the promotion of the use of energy from renewable sources and directive on common rules for the internal market for electricity.

3.1.1 Directive on the promotion of the use of energy from renewable sources

This Directive (RED2) was formally adopted in December 2018 and aims to promote the growth of the share of renewable energy sources in final energy consumption by 2030. It provides an update of binding renewable energy targets for the European Union for 2030 of 32% and aspires to create an enabling environment to accelerate public and private investment in innovation in the energy-related sectors.

The text of the Directive specifically stresses: “[...]reducing energy consumption, increasing technological improvements, incentives for the use and expansion of public transport, the use of energy efficiency technologies and the promotion of the use of renewable energy in the electricity sector, the heating and cooling sector and the transport sector are effective tools, together with energy efficiency measures, for reducing greenhouse gas emissions in the Union and the Union's energy dependence[...].” While this paragraph provides a very broad overview of all the relevant tools that contribute to energy transition and greenhouse gas emissions reduction, it could be enriched by giving more attention to the framing and targeting of specific groups of stakeholders and their needs by those tools. Based on the findings collected in different ECHOES research activities framing will play a key role in the engagement of the consumers in the energy transition. While transposing this directive into national regulation we suggest underlining that the promotion of the use of renewable energy in the electricity sector should be targeted to specific groups of customers taking into account their gender- and context-specific decision-making factors.

Further on, Paragraph 12 of the Directive states that: “[...]in order to support Member States' ambitious contributions to the Union target, a financial framework aiming to facilitate investments in renewable energy projects in those Member States should be established, including through the use of financial instruments[...].” Following ECHOES' general policy recommendation, we suggest in this context it is important to stress the simplicity and transparency of the financial framework and instruments that will be elaborated by Member States. Further on ECHOES policy recommendations H.1 and H.3 should be also applied while implementing this paragraph of the directive into national laws.

In the context of stimulation of investments in the renewable energy installation we consider, Article 16 of the directive, on organisation and duration of the permit-granting process, which states: “[...] Member States shall set up or designate one or more contact points. Those contact points shall, upon request by the applicant, guide through and facilitate the entire administrative permit application and granting process. The applicant shall not be required to contact more than one contact point for the entire process[...].” This is a critical point to be implemented by Member States, as having one contact point guiding the whole application process can increase significantly the number of investors and installation due to decreased uncertainty and increased understanding of the whole procedures.

Looking in details on some of the specific models the directive considers promotion of small-scale installations, “[...] which can be of great benefit to increase public acceptance and to ensure the rollout of renewable energy projects, in particular at local level.” In this context ECHOES results show the importance of providing micro-funding schemes for small-scale RES. The provision and elaboration as well as campaigns informing relevant stakeholders about the availability of such micro-funding schemes could also be suggested to be included in the national plans.

In Article 18 of the Directive regarding information and training requires that, “[...] Member States shall ensure that information on support measures is made available to all relevant actors, such as consumers including low-income, vulnerable consumers, renewables self-consumers, renewable energy communities, builders, installers, architects, suppliers of heating, cooling and electricity equipment and systems, and suppliers of vehicles compatible with the use of renewable energy and of intelligent transport systems.” Considering the differences in the way different target groups respond to framing, as confirmed in multiple ECHOES research activities, it is suggested to stress the importance of building campaigns and providing information while carefully considering the required framing of energy policies to account for the things, groups and places that people in the targeted group identify with.

3.1.2. Directive on common rules for the internal market for electricity

This Directive aims to address the current challenges of the electricity market and to enable higher employment of the various energy efficiency solutions, which allow the EU to become a world leader in energy efficiency and energy production from renewable energy sources. While several policy recommendations provided in ECHOES are applicable to this Directive, one of the key recommendations is to ensure that the electricity market structure resulting from any new policy will support low-carbon or ‘green’ electricity retail packages and require that information concerning the availability of these packages is distributed to consumers. Furthermore, it is important to increase awareness for the need to accelerate the transition to more sustainable energy lifestyles and practices, among individuals, and self-organized collectives and representatives of formalized agencies, and companies.

Moreover, during ECHOES workshops as well as other research activities, the importance of taking into account the transport sector and electric mobility, which is relatively briefly mentioned in Article 33 of the directive, when considering electricity market policies is critical – as these sectors are becoming more and more interconnected. Thus, the suggestion is for the policy processes of smart grid development and EV development to be integrated into one process and also require evaluation of all the consequences to the urban environment from uptake of e-mobility in the city (needed infrastructure, spaces, workplaces, etc.).

Further on looking at Article 16, on Citizen energy communities, which states that “[...] Member States shall provide an enabling regulatory framework for citizen energy communities ensuring that: (a) participation in a citizen energy community is open and voluntary; (b) members or shareholders of a citizen energy community are entitled to leave the community, in which case Article 12 applies; (c) members or shareholders of a citizen energy community do not lose their rights and obligations as household customers or active customers; (d) subject to fair compensation as assessed by the regulatory authority, relevant distribution system operators cooperate with citizen energy communities to facilitate electricity transfers within citizen energy communities; (e) citizen energy communities are subject to non-discriminatory, fair, proportionate and transparent procedures and charges, including with respect

to registration and licensing, and to transparent, non-discriminatory and cost-reflective network charges in accordance with Article 18 of Regulation (EU) 2019/943, ensuring that they contribute in an adequate and balanced way to the overall cost sharing of the system.” While all the points mentioned in this paragraph are highly relevant for successful operation of energy communities, ECHOES suggests additionally that in order to stimulate the participation of consumers in these communities the following recommendation should be taken into account: Member states should provide legal support to consumers for understanding and addressing the administrative and market barriers of their participation in energy communities and second supporting collective stakeholders through information provision and skills training should be also considered.

Considering further deployment of smart metering technology, covered in Article 19, “In order to promote energy efficiency and to empower final customers, Member States or, where a Member State has so provided, the regulatory authority shall strongly recommend that electricity undertakings and other market participants optimise the use of electricity, inter alia, by providing energy management services, developing innovative pricing formulas, and introducing smart metering systems that are interoperable, in particular with consumer energy management systems and with smart grids, in accordance with the applicable Union data protection rules.” ECHOES results suggest importance of covering the potentials of energy consumption feedback systems that provide feedback in a user-friendly way should be made available to consumers. While the Directive covers highly important aspects of smart metering technology, it lacks the focus on the consumers’ perspective in this context, especially the importance of tailored campaigns showing how exactly this ‘optimisation of electricity’ should work, how can different types of consumers benefit from the provided ‘energy management services’, and how exactly their data should be used and protected. Setting up systems the consumers trust with their data and choices is of key importance for the success of this technology.

3.2 National and local examples

In this Section, selected examples of how ECHOES findings and derived policy recommendations can be implemented to the national regulatory context in several European countries are presented.

Austria

The Styrian E-Mobility Strategy 2030 focuses on the meaningful and effective market simulation of electric mobility in Styria. It takes into account the objectives of the overall transport concept 2008+, the regional mobility plans under preparation and the climate and energy strategy (KESS 2030). The E-Mobility Strategy focuses strategically on two main areas:

- Improving the eco-friendly network (use of public transport, cycling and walking) as part of multimodal or intermodal transport experiences
- Stimulation of technology transfer from fossil-fuelled internal combustion engines to electric motors powered by renewable energy

In the past, only minor improvements in energy and climate protection have been achieved in the mobility sector. The main reason is the strong dependence on motorised private transport types that use fossil fuels and diesel. The number and size of vehicles have grown and the number of people travelling per vehicles has fallen. Additionally mobility is of major importance in terms of energy: slightly more than 22% of Styria’s final energy consumption can be attributed to motorised private transport. Besides the need to reduce motorised private transport, the shift towards an eco-friendly network (public transport, cycling, walking) and the promotion of climate-friendly and renewable energy sources and energy-efficient engines, E-Mobility is a key measure in decarbonising transport. Reducing the climate and environmental impact of transport and dependence on fossil fuels are key challenges that will need to be consistently addressed in the coming years and decades; not only in Styria and

The following ECHOES policy recommendation can be implemented to adjust the Styrian e-mobility strategy: “Incentives and programs for e-mobility in policy measures need to be developed and contextualized through collaborative stakeholder involvement.” To develop strategies, stakeholder expertise and know-how is obtained both, inside and outside, and measures needs to be discussed and worked out with external stakeholders like social partners, associations of cities and municipalities, universities and NGO representatives. This kind of process is being used and further developed in every Styrian strategy – in the e-mobility strategy, the climate and energy strategy, the climate and energy action plan and in the climate change adaptation strategy. Specifically Measures 3.8 (E-Action plans in municipalities) and 4.4 (Networking platform E-Mobility Styria – which is a shared learning and knowledge dissemination for municipalities/regions, identification of synergies and new mobility projects) of the strategy need to be implemented while taking into account recommendations elaborated in ECHOES in order to increase acceptance and uptake of electric mobility in the region.

Another example of policy where ECHOES results can be applied in Austria is the Renewable Energy Expansion Law (which is currently under preparation). The Renewable Energy Expansion Law will address parts of the requirements of the European Clean Energy Package, in particular the recast of the EU Renewable Energy Directive. Among others things, the law will define the framework for Renewable Energy Communities. Thereby, the options for collective renewable energy related initiatives will be expanded as compared to the collective self-consumption schemes that were already enabled by § 16a of the amendment of the federal electricity act (EIWOG) in 2017.³ The ECHOES findings and recommendations relating to collective investment and ownership schemes for renewable energy are of high relevance for the definition of the renewables expansion law and related acts. This concerns the following recommendations G.1, G.2, H.1, and H.6 with the particular goals of: a.) Providing clear and concise information about existing incentives and funding options, easy access to funding (supported by consulting, clearer application procedures, etc.) and, b) providing legal support to consumers for understanding and addressing the administrative and market barriers (i.e. collective investment and ownership schemes) and supporting collective stakeholders through information and c.) raising public awareness and understanding about active funding schemes for energy efficiency and RES-based measures.

Austria has a complex support system including national and federal state support schemes under different umbrellas (e.g. renewables expansion, retrofitting). Local, bottom-up initiatives require relevant information in order to make best use of the existing and future schemes. Given the complexity of these schemes, collective self-consumption schemes currently turn out to be mostly driven by housing companies and electricity suppliers. In order to support the creation of bottom-up initiatives, relevant support and information provision to, e.g., tenants' organisations would be required. This will be even more the case for future energy communities. The 2017 amendment of the Austrian EIWOG clearly attributed the responsibility for measurement and attribution of the involved energy of collective self-consumption schemes to the utility companies that manage the electricity grid. Subsequently, the regulator E-Control published applicable fees that DSOs can charge for these services. However, the actual implementation requires a shift of the management system within the DSOs and the required services were not always available as foreseen. Therefore, it is of high relevance to remove practical implementation barriers in this regard, for future development of renewable energy communities. In this context, ECHOES policy recommendations namely to standardize the requirements of electricity distribution companies to legalise collectively-owned installations and avoid discriminatory situations to grid access and to define clear rules on how to measure and bill shared self-consumption, as well as a regulatory framework allowing and enabling the sharing of energy surpluses among prosumers and consumers could be included to contribute to a faster a smoother development of energy communities.

³ Federal Act Providing New Rules for the Organisation of the Electricity Sector (Electricity Act 2010 – EIWOG 2010), amendment 2017

Bulgaria

One of the key regulatory initiatives with respect to the energy field in Bulgaria is the integrated National Energy and Climate Plan (NECPs) which has to cover the five dimensions of the Energy Union for the period 2021 to 2030 on the basis of a common template.⁴

The main targets of NECPs are: reduction of GHG emissions; increase of share of renewable energy in gross final energy consumption in the country for the period 2021—2030 and estimated trajectories; increased cumulative energy savings over the period 2021—2030 and indicative milestones up to be developed; diversification and other energy security objectives; transmission capacity and infrastructure for the functioning of the internal market along with regulations for market liberalisation and social assistance regarding energy poverty. The plans also target various research topics as well as innovation and competitiveness objectives.

Considering the application of ECHOES policy ready recommendations, **the subtitle 3.1.2. Renewable energy claims the need for:**

"Creating conditions for renewables self-consumers and renewables communities"

"Creating conditions for final consumers and household consumers in particular to be entitled to participate in 'renewable energy communities' which can produce, consume, store, or sell energy from renewable sources". However the way of implementation and the impact of the measures is only mentioned too generally and not specified. The implementation should build upon analysis and estimation of national and local experience in previous programmes in the country; it should make use of the knowledge and skills acquired in building trust to EU and national policy, e.g. among the homeowners (homeowners' associations) through the involvement of local public authorities as guarantees and investors in the process of housing renovation.

Thus, based on the ECHOES findings we recommend to enrich this formulation by adding a requirement of the involvement of local authorities as investors or initiators of public-private partnerships for deploying RES installations and further on also stress out importance of providing micro-funding schemes for small-scale RES is of key importance for households and SMEs in order to sustain the uptake of renewable generation.

An example of a local level policy document to which ECHOES recommendations can be applied is the Vision for Sofia, which is *at a final stage before official approval by Sofia City Council*.⁵ It is a non-binding strategic policy document, which aims to shape the long-term goals and objectives of the city development through a three-year long intensive collaborative process open to a broad range of policymakers, institutions, experts and citizens, and expected, after being officially adopted by the City council of Sofia, to support the local decision-making process by providing a reference framework concerning the implementation, monitoring and evaluation of the key policy activities. The document outlines in a qualitative manner the overall objectives and their implementation measures to be reached by consecutive and/or parallel steps. Reaching "Sustainable resource and energy balance" is one of the stated objectives. The need for such document has been advocated by various citizen groups and politicians as part of the critique towards the active General Spatial Development Plan of the municipality predominantly following the logic of the real estate market. The plan was elaborated in the period 2016-2019 with funding from Sofia municipality. A survey on quality of life has been undertaken in step 3 of developing the Vision. One of the Vision for Sofia objectives ("Sustainable resource and energy balance") aims at reaching a future situation where:

"The energy mix is mainly produced by RES"

"Sofia has managed, through market incentives, regulation and proactive integration of technological innovations, to minimize the consumption and production of energy from polluting and non-renewable sources that cannot fit

⁴ https://ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_bg_necp.pdf

⁵ <https://vizia.sofia.bg/goals/>

into the circular economy models. [...]. This has resulted in tackling climate issues, has created new jobs in green energy production, and at the same time has helped to liberalize the energy market, giving freedom to personal production and choice for energy suppliers, which has reduced energy transmission losses on the grid."

"Buildings are energy efficient"

"The transition to carbon-neutral construction has been successfully completed. New construction consists only of buildings with near-zero consumption, and for all existing buildings (except for cultural monuments), effective energy efficiency measures have been put in place that significantly reduce energy consumption. Energy efficiency methods are used to evaluate the result, such as infrared imaging of buildings. This results in significantly reduced energy consumption and the need for a resource to produce and purchase it and allows this resource to be directed towards other urban goals and improvements."

In this context, ECHOES' recommendation is to increase awareness for the need to accelerate the transition to more sustainable energy lifestyles and practices among individuals, self-organized informal collectives, and representatives of formalized agencies, and companies. Although some very peculiar aspects of the measures have been outlined in the document, the issues related to existing lifestyles were only partially addressed by the survey. Consideration for lifestyles and behavioural modes through additional modelling and scenario development would be a beneficial approach linking the Vision for Sofia with other national and local strategic documents, e.g. the *Plan for sustainable energy development* (up to be prepared as a second generation document after the first one adopted for the period 2012-2020) and the *Sustainable Urban Mobility Plan 2019-2035* (recently adopted yet with estimated deficiencies concerning the communication of the measures proposed).

Another national level policy where ECHOES recommendations can be applied is the Bulgarian National Long-term Renovation Strategy. In the period 2015-2019, the Government of the Republic of Bulgaria made the first major steps dedicated to mitigate the issues of unsatisfactory renovation rates and overspread energy poverty by executing the *National Programme for Energy Efficiency of Multifamily Residential Buildings*.⁶ With a budget of BGN 2 Billion (about EUR 1.023 Billion), the Program financed the renovation of 2022 multifamily residential buildings. The Program had a positive impact, achieving tangible energy savings and what is more important – significantly improving thermal comfort in the dwellings. However, this happened under the condition of providing of 100% financing and minimal commitment of the homeowners, which also created unrealistic expectations for the citizens. The next phase of the *National Programme* is likely to continue with a lower level of financing, however no clear financial scheme is currently available. The most frequently discussed grants levels vary between 70 and 80%, but the questions about the mechanisms to support the co-financing of the homeowners, especially contributions expected from citizens below the line of energy poverty, remains unanswered, and poses a serious social and political problem which has not been positively approached so far.

However, under the requirements of the Regulation on the Governance of the Energy Union, the *National Long-term Renovation Strategy* should tackle this issue in medium- and long-term perspective. In order to overcome the extremely high social tensions related to the decrease of the grant rate and to secure sustainable continuation of the state policy, it must employ a number of actions directly related to ECHOES recommendations:

- to ensure stability of regulatory frameworks, especially through stabilization and long-term perspective of financial incentives for individuals and firms;
- to develop a system of indicators to capture technical and social performance of energy efficiency interventions which is sensitive to local building traditions and energy cultures and practices;
- to regulate homeowners' obligations in return to the funding support in the normative documents;
- to facilitate support to the municipal level through streamlined administrative processes, supporting guidance and support to end beneficiaries ;
- to support demonstration and pilot projects to make the advantages of innovative solutions tangible.

⁶ <https://www.mrb.bg/bg/energijna-efektivnost/nacionalna-programa-za-ee-na-mnogofamilni-jilistni-sgradi/>

Finland

In Finland, there is an established practice that each Government draws up an energy and climate strategy, where the actions to achieve the energy and climate policy targets specified in Government Programmes, e.g. sectoral greenhouse gas (GHG) emission reduction targets, are outlined.⁷ The national Energy and Climate Strategy prepared by Prime Minister Juha Sipilä's Government, in office between 2015-2019, included several new policies and measures, like phasing out of coal by 2030, halving the use of mineral oil by 2030, and to increase the share of renewables from energy consumption above 50% by 2030. In 2017, the first ever built Medium Term Climate Policy Plan was also published, which included measures to achieve the 39% GHG reduction target of the burden sharing sector by 2030 (compared with 2005 emissions), which was set by the EU for Finland. To achieve that target, the GHG emissions of the transport sector should be halved from the 2005 level by 2030. As an example, a minimum aim of having have 250,000 electric vehicles on the road in 2030 (including fully electric vehicles, hydrogen-powered vehicles and rechargeable hybrids)⁸ was set. The new Governmental Programme of Prime Minister Antti Rinne's Government, nominated in June 2019, suggests that Finland should reach carbon neutrality by 2035 and after that become carbon negative. Also, targets to reducing transport emissions by at least 50 per cent compared to the 2005 level are assumed to be in line with the carbon neutrality objects. In addition, a zero GHG emission target by 2045 for the transport sector has been set but no corresponding legislation or policies are implemented yet. However, the recent statistics show an increasing trend in GHG emissions in the transport sector and the market share of electric cars remains rather low. The Government Programme mentions a reform on taxes and payments as a key measure to be initiated. The policies implemented and under further preparation have their role in making the transport less emitting and supporting the country in achieving its carbon neutrality targets by 2035. As there were some 15,000 electric cars in Finland in early 2019,⁹ there is a high demand for measures to pave the way for achieving the targets on electric mobility outlined.

One of the key ECHOES recommendations that policy instruments need to be sensitive to the target group, is seen relevant for both general energy and climate and electric mobility related policymaking, and could boost the efficiency of such policies implemented in Finland. The recommendation, based on observed differences in what appeals to men/women and younger/older people (younger people respond stronger to environmental values, men more to emotional messages relating to the behaviour, women more to identification with a social group), could perhaps play a larger role in shaping the energy and climate related policies in Finland. It is also recommended to include gender- and context-specific decision-making factors in the design of policy campaigns to increase their efficiency. The above-mentioned especial target on electric mobility could be boosted by tailored implementation of nine foci-specific ECHOES policy recommendations on electric cars or electric mobility. One concrete example that a policy document could adopt, could be the ECHOES conclusion on identification of environmental identity as important for the EV adoption. Hence, the EV incentives to be specified in policy processes in Finland should foster the possibility to express one's environmental identity or by outlining their environmental qualities. As costs will still play a role, it would be important to identify what incentives and tax reductions can be tailored for each country to support electric vehicle adoption, if any. In Finland, there is also on ongoing public discussion on life-cycle impacts of mobility options and, thus, it is recommended that there will be more transparent assessments of the lifecycle impacts of mobility options and interface this system with local planning boards and citizens. Despite numerical estimate on the impact of the above-mentioned policy recommendations for Finland is currently not available, all these recommendations have evidence-based relevance based on ECHOES results.

⁷<https://tem.fi/en/energy-and-climate-strategy>

⁸<https://tem.fi/documents/1410877/2769658/Government+report+on+the+National+Energy+and+Climate+Strategy+for+2030/0bb2a7be-d3c2-4149-a4c2-78449ceb1976/Government+report+on+the+National+Energy+and+Climate+Strategy+for+2030.pdf>

⁹http://www.aut.fi/tilastot/autokannan_kehitys/sahkoautojen_maaran_kehitys

Germany

Using an example of local initiative of “Climate districts” in Leipzig,¹⁰ we demonstrate which of the ECHOES recommendations can be used to boost the engagement of consumers in such projects. Energy-efficient redevelopment of cities has been an important goal of German politics in the past decade. However, the funding scheme directed to support the renovation of single buildings led to scattered improvements. The national support program 432 “energetic urban renovation” provides grants for integrated concepts to restructure urban districts, rather than single buildings. The city of Leipzig started the energetic renovation management program (ESM) for two “climate districts” (Alt-Schönefeld and Lindenau-Plagwitz) in 2015. The program insures an integrated approach with other interests in urban development. For example, the program includes building audits and consulting services for real estate owners as well as residents, information campaigns at schools and improvements in public transport and alternative mobility services such as carsharing.

The project is executed at a municipality level but is supported by a national program. By targeting specific neighbourhoods, it is easier to adapt locally and the interaction with residents in counselling sessions facilitates collaborative development in the area. However, the collaboration with residents could be increased through action groups, informational events or a call for policy suggestions from residents. The counselling that is provided within the program, helps real estate owners and residents with information about different incentives and funding options and as suggested in the ECHOES recommendations should provide clear and concise information about existing incentives and funding options, easy access to funding (supported by consulting, clearer application procedures, etc.) as well as legal support to consumers for understanding and addressing the administrative and market barriers and supporting collective stakeholders through information provision and skills training. This promotes renewable energy installations in public-private partnerships and following ECHOES policy suggestion creates frameworks stimulating the participatory design of local renewable energy production in public private partnership. The program also helps to diversify mobility options other than individual car transport which is also supported in the suggested by ECHOES policy recommendations.

Besides having environmental benefits, the renovation of districts has economic and social consequences. Having a system of indicators, which capture the technical and social effects of the project would be helpful to monitor its effectiveness and communicate the results to residents and the general public. Further on, we suggest to increase the awareness of citizens about the project, as if the climate friendly status of the district was heavily publicised, it may shape the residents’ environmental identity, which in turn drives further pro-environmental activities, such as electric vehicle adoption. Following ECHOES policy recommendations we also suggest that climate districts could be capitalized on as a shared energy memory, if it is communicated accordingly. Thus, properly tailored and frame campaign around the project can help to shape a new energy culture in the district and beyond.

Italy

In September 2019, the Italian Ministry of Economic Development released the updating note to the Economic and Financial Document (DEF), which is the main Economic and Finance planning scheme of the Italian government, leading to the main yearly State Finance Act. In this document, one of the central themes is related to Energy and Environment (NADEF 2019, p. 9411). According to the stated programmatic goals, the Italian Government is planning a so-called ‘Green New Deal’, that will be organized in order to implement a radical change of the cultural

¹⁰ <https://www.leipzig.de/bauen-und-wohnen/stadterneuerung-in-leipzig/foerderprogramme/energetische-stadtsanierung/>

¹¹ NADEF 2019 Available on

http://www.dt.mef.gov.it/modules/documenti_it/analisi_programmazione/documenti_programmatici/def_2019/NADEF_2019__FINALE.pdf

paradigm that leads to the inclusion of environmental protection and biodiversity conservation among the fundamental principles of the Italian constitutional system. As stated in this document, in the framework of the 'Green New Deal' strategy, public investment plans will be focused on protecting the environment, including an improved contrast to environmental pollution risk, the progressive and increasingly widespread use of renewable sources, the protection of biodiversity and the seas, the fight against climate change in support of sustainable development and the improvement of air quality. Measures that encourage socially responsible practices will be adopted by businesses and financial stakeholders and investors. The need to promote development and introduction of new technologies, in line with the needs of environmental protection and population health, are recognized with the objective of making the 'ecological transition' more effective and steering the entire production system towards a circular economy model, which promotes the culture of recycling and definitively dismisses the culture of waste. In order to favor the "ecological transition", a long-term strategy for the reduction of greenhouse gases by 2050 is being prepared by the Italian Government. Different paths of decarbonization will be identified, taking into account the specificities of the productive, energy-related, economic and social structure of the country, which will allow to get emissions reduction targets until climate neutrality is reached.

In this regard, the National Plan for the research of the electrical system was also approved. The Plan promotes projects related to new network architectures, aimed at making the electricity system more flexible and ensuring its safe management. Priority will be given to the development of renewable sources with the provision of incentives for the diffusion of photovoltaic, wind, hydroelectric and purification gas plants, with a planned target of plant implementation for an overall power of 8.000 MW, and an increase in renewable energy production of about 12 Billions kWh. With regard to sustainable mobility issues, a regulatory intervention scheme is being implemented, with the aim of putting into practice incentive measures for the adoption of more sustainable lifestyles with the final goals of improving air quality in urban contexts.

In parallel to this general framework plan, a more specific legislative measure focused on climate change and green economy, which has been labelled as "Climate Decree" (Decreto Clima) is currently under preparation by the Italian Ministry of Environment, and will be likely discussed in one of the next meetings of the Council of Ministers, and likely approved in October or November 2019. According to newspapers reports, this decree will contain specific measures (e.g., financial incentives) supporting consumers to abandon of Euro 2 or Euro 3 cars and motorbikes in favor of bicycle and e-bikes or public transport subscription. In addition to that, the climate decree will also contain measures such as financial aid to "green corners" (i.e., where bulk food and detergents are sold) within shopping areas, and funds for increasing public transport lanes in metropolitan areas.

From the Italian context point of view, we identify the following ECHOES policy recommendations related to the above mentioned energy-related policies:

- Identify what incentives and tax reductions can be tailored for each country to support electric vehicle adoption, if any, following recommendations C.1 and C.4;
- Identify country-specific motivators that can be utilized for increasing the awareness on energy consumption and energy savings in buildings. Monitor these motivators for changes over time;
- Provide clear and concise information about existing incentives and funding options, easy access to funding (supported by consulting, clearer application procedures, etc.) following recommendation H.1;
- Increase awareness for the need to accelerate the transition to more sustainable energy lifestyles and practices, among individuals, self-organized informal collectives and representatives of formalized agencies, and companies: there is a need for systematic information and action campaigns targeting different publics at different levels and institutions about e.g. e-car sharing, co-housing, as suggested in recommendation H.2;

Implementing a radical change of the cultural paradigm in order to guarantee environmental protection and biodiversity as fundamental principles of the Italian constitutional system requires the exploration of appropriate methods to facilitate collaboration between public and private actors, an essential element for implementing the measures contemplated in the current policies under discussion in Italy. The introduction of new technologies for the sustainable energy transition, the shift towards a more generalized “green lifestyle” in the Italian society, and the commitment to sustainable urban solutions are initiatives that will necessarily involve public institutions, companies, knowledge-based organizations and citizens. It will be essential, to ensure the success of this ambitious plan of the Italian Government, to create a physical and cultural network connecting all the parts of our cities and life spaces, from people to cars, to homes, to green areas.

To facilitate the collaboration between the mentioned components, it will also be important to collect and share data about problems and active strategies for sustainable development, also through the development of applications and ICT tools that facilitate the active participation of citizens. For example, ICTs based platform could be created to encourage citizens, the public sector, and organizations to share their projects and their ideas about the energy and ecological transition. Referring to the provision of incentives for the diffusion of renewable energy plants, more accessibility and stability of policies might be effective as well as harmonizing national and regional policies in force. In Italy, different incentive plans to support the adoption of electric vehicles are active at the regional level. Consequently, there is not uniformity with respect to facilitations, tax relief and incentives. Harmonizing these policies in terms of the incentives provided, rules and bureaucracy modalities would then be an important step in order to foster the adoption and purchase path of electric cars and bikes, the use public transport, and the consumption of low-carbon products.

Norway

In 2017, the Norwegian government tasked the Norwegian Water Resources and Energy Directorate (NVE) to lead work on a proposal for a national framework for onshore wind power. This proposal was to include an updated knowledge base for onshore wind power and maps with suggestions for areas most suitable for wind power. In April 2019, after NVE published its proposal¹², opponents of onshore wind power production in Norway raised fairly harsh criticism towards the proposal, pointing out the relatively large areas defined by the framework as suitable locations, signalling that there would be massive protest and opposition if wind power production would be built in all the areas mapped as suitable by the proposal. Even though the mandate stated that NVE should map the most suitable areas for wind power production (e.g., good wind resources), much of the debate has therefore centered around whether or not to build onshore wind power in Norway, if it has any emission reduction impact at all, and a general debate around nature conservation vs. climate mitigation.

A.1 of the ECHOES policy recommendation suggests that specific paths to reaching common climate and energy goals under varying conditions have to be identified through collaborative processes and could be applied to this context. In the aftermath of the publication of the proposal, the backlash and opposition towards onshore wind was amplified greatly by the output. While this might be partly due to poor communication of the Directorate's actual mandate and what it was set up to investigate and highlight, it still suggests that reaching common climate, energy and nature conservation goals under different conditions requires strong local and regional involvement with all relevant stakeholders and that legitimacy can be achieved more easily through collaborative and deliberative processes. Another key insight from the project is that there is a significant untapped potential for participation and willingness to invest in renewable energy from individuals and energy cooperatives across Europe. The government could, therefore, facilitate, simplify, and inform citizens and cooperative suitable schemes and pathways for this

¹² Proposal for national framework for wind power production - Forslag til nasjonal ramme for vindkraft http://publikasjoner.nve.no/rapport/2019/rapport2019_12.pdf

type of citizen engagement in the energy transition. This could improve acceptance and reduce conflict levels in the population around renewable energy projects.

Spain

The draft royal decree amending the royal decree 235/2013, 5 April, which approves the basic procedure for the certification of the energy efficiency of buildings¹³ and regulates the certification of the energy efficiency of buildings, is considered an example of policy on the national level which can be enriched and more efficiently implemented with input from ECHOES policy recommendations. The target of the above-mentioned policy is to update and expand the scope of the technical installation concept of a building, to improve the procedure for energy certification and the content of the qualification. Further on, it aims to ensure the quality of the certificates, through the possible revision of the level of qualification and accreditation required to act as a competent technician and to adapt the databases of energy efficiency certificates in Autonomous Communities, so as to allow a better collection of energy consumption data measured or calculated in buildings and to improve and make more accessible the information on the energy efficiency of the properties that advertise or promote for rent or sale.

Several ECHOES policy recommendation are relevant in this context. To begin with, we suggest to include a requirement in this document to development energy use feedback systems that provide feedback when it is needed, at the place it is needed, and in a form that supports the energy decisions made at this point in time. Such systems will help to manage electricity consumption in the building and will help consumers to make informed decisions when it comes to the way energy is used in their dwelling. Another important recommendation in this context is to provide targeted and clarifying information on the legal status of housing companies, especially clarifying the issues on taxation. As concluded from various ECHOES research activities, absence of information as well as unclear housing legal and tax requirements can hamper improvements in energy efficiency. So providing clear legal and tax information for housing companies is required.

Turkey

The Turkish government has declared five areas as Renewable Energy Resource Areas (RERA/ Yenilenebilir Enerji Kaynak Alanı – YEKA) for the establishment of large scale renewable energy production plants.¹⁴ The initial regulation associated with RERA's was published in 2013,¹⁵ aiming to decrease the import dependence of Turkey for energy resources, support domestic production, and reduce the current energy deficit.¹⁶ The RERA regulation provides incentives and offers a 15-year fixed-price purchase guarantee for licensed renewable energy plants. On the other hand, the establishment of a domestic wind turbine production plant and an R&D centre are required. The share of domestic materials in wind turbine production is required to be at least 65%, and the R&D centre is required to have an annual budget of 5 million USD and at least 80% domestic employment for 10 years¹⁴. Recently, in February 2019, the Electricity Market Licence Regulation¹⁷ that also covers the licencing process for RERAs was

¹³ <https://energia.gob.es/en-us/Participacion/Paginas/Cerradas/Proyecto-Real-Decreto-modifica-Procedimiento-Certificación-Eficiencia-Edificios.aspx>

¹⁴ Deloitte Report on Renewable Energy Resource Areas.

Available at: <https://www2.deloitte.com/content/dam/Deloitte/tr/Documents/energy-resources/yeka-infographic.pdf>

¹⁵ Elektrik Enerjisi Üretimine Yönelik Yenilenebilir Enerji Kaynak Alanlarının Belirlenmesi, Derecelendirilmesi, Korunması ve Kullanılmasına İlişkin Usul Ve Esaslara Dair Yönetmelik <https://www.resmigazete.gov.tr/eskiler/2013/11/20131127-6.htm>

¹⁶ Pwc - An Assessment on Renewable Energy Resource Areas.

Available at: <https://www.pwc.com.tr/tr/sektorler/enerji-altyapi-madencilik/enerji-spotlights/yeka-uzerine-bir-degerlendirme.html>

¹⁷ Elektrik Piyasası Lisans Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik <https://www.resmigazete.gov.tr/eskiler/2019/02/20190216-3.htm>

amended to allow for changes in the shareholder structure and transfer of shares during the pre-licensing period, which was prohibited in the earlier version of the regulation. This restriction was put into effect in order to guarantee that the companies or consortiums that participate in the RERA tenders have dependable business plans and strategies, whereby they can realize and implement what they commit for. Another aim of the restriction was to prevent ‘broker’ companies from acquiring the licenses in the first place, and later ‘selling’ these licences, creating a ‘license market’ that does not serve the aims of RERAs. However, the restrictions on shareholder structure and transfer of shares also hit truly-committed consortiums that needed to undergo changes during the long tender and licensing process. In one specific example, the domestic company in the consortium wanted to take over the shares of an international company in the same consortium. This transaction would increase the domestic share in the RERA, however, it was not allowed due to the restriction in the earlier regulation.¹⁸ The Electricity Market Licence Regulation was amended in order to resolve such situations.

The initial version of the Electricity Market Licence Regulation involved a restriction that, in practice conflicted with the aims of RERAs. Based on the policy suggestions derived in ECHOES, we suggest to pay attention to defining the standards for conducting RES-related reforms in the energy field in a coherent and transparent manner, based on participatory study of the short, medium, and long-term impacts on all stakeholders. The Electricity Market Licence Regulation was prepared with inputs from stakeholders, but missed two aspects stated in the ECHOES policy recommendations: first, being “coherent and transparent”, and, second, considering the “...medium, and long-term impacts on all stakeholders...”. This omission affected some consortiums negatively, even possibly preventing some consortiums from participating the tender process. Hence, following this policy suggestion for similar cases in the future will definitely be beneficial. Another relevant ECHOES policy suggestion, G.2, recommends to “harmonize different regulatory frameworks and ensuring compliance between national, regional and local policies in terms of funding, incentives, regulations”. In this particular case, there are two components of the regulatory framework, the RERA regulation and the Electricity Market Licence Regulation, the initial versions of which are not very well harmonized. This resulted in the need for amending the regulations, and potential conflicts resulting in deficiencies to achieving the targets of both.

4. CLOSING REMARKS

4.1 Exploitation of ECHOES policy recommendations

The key exploitation of these results comes in the potential positive effects that they can have when applied to future and under construction energy policies. A particular strength of the recommendations is in their application to new or existing policies and regulations that require direct participation from market actors, or policies that may suffer from a lack of social acceptance. The empirically-validated results from across ECHOES research efforts suggest that employing the recommendations can improve the impact of such policies by fostering higher levels of participation and acceptance by citizens. To reach a full implementation of the low-carbon energy transition, acceptance and participation from a substantial portion of Europeans is required. The recommendations themselves are flexible in two ways: firstly, looking at the examples of application of the recommendations to multiple EU level and national level policies, while keeping in mind the heterogeneity observed across the European countries, ECHOES findings are wide-ranging which allows to implement them in different contexts; secondly, these recommendations constitute advice on which aspects of agent behaviour to consider when crafting a specific policy, and how behavioural levers can be used to create more impactful policies. Some of the policies are generalizable to many different energy-related contexts and topics, while others are specific to a given technology or a specific issue that policy may address. ECHOES research focused on the technologies in smart energy, electric mobility, and buildings – thus many recommendations come out of empirical work that dealt specifically with these

¹⁸ Green Economy - Amendment regarding Renewable Energy Resource Areas in the License Regulation.
Available at: <https://yesilekonomi.com/lisans-yonetmeliginde-yeka-degisikligi/>

technological foci. As such, new policies that address these sectors would be especially aided by referencing the recommendations in the early stages of crafting the policy.

Many of the policies deal with the idea of framing the policy and making the ideas relevant to specific groups. This is based on the ECHOES results that different groups, delineated by e.g. socio-demographics, and social units, e.g. firms or collectives, have different attitudes and behavioural drivers regarding energy – making it clear that the same intervention will not work for all people and groups. Thus, one exploitation of the results that ECHOES hopes to see is that they lead to a more targeted approach to policy that seeks to enhance the participation of specific groups, especially those that are currently underserved by the energy transition, such as lower income groups. For this type of exploitation to be realized it is **not** necessary that a policy only allow for certain groups to participate, e.g. a lower income only subsidy or similar. Instead, the psychological, economic, and cultural levers identified in ECHOES can put to use within the policy to **implicitly** target a specific group. Such targeting can be accomplished by following the results of ECHOES' psychological studies found in Carrus et al. (2019b), which pertain to groups from across 31 European nations. However, for even more impactful implementations of policy framing specialized studies are recommended, including market research (survey) methods and focus group interviews within the specific context. Such additional methods will allow for a fuller exploitation of the framing aspect of ECHOES policy.

As detailed in Deliverable 8.4 of the ECHOES project, project partners intend to keep working with, disseminating and commercialising these recommendations within their spheres of influence. As part of this effort, the ECHOES conference took place in Trondheim in September of 2019 and included external stakeholders and representatives from policymaking bodies and the European Commission. These individuals are in a position to exploit the policy results of the project and will be followed up with.

4.2 Conclusion

A large part of the initial work in ECHOES was to critically review the current energy policy and regulatory environment from across Europe in regards to the representation of energy market actors within the policy (Klößner et al., 2018). These actors' motivations and decision making processes are too often oversimplified. This oversimplification can hinder the uptake and acceptance of the policy and can reduce the impact and efficacy of the policy. This is encapsulated in the overarching ECHOES conclusion that there is no valid one-size-fits-all policy approach. Thus, ECHOES prescribes that a more holistic approach to understanding consumer groups be adopted in future policies and that this understanding be grounded in empirical social science research.

This report represents the final output of the ECHOES project as it pertains to energy policy and regulation in Europe. The goal of the report is to distill the myriad research activities that took place in ECHOES, across 3 conceptual levels (micro, meso and macro), 3 technological foci (smart energy technology, buildings, and electric mobility), and various scientific disciplines, down into their most relevant and clear policy conclusions. The report contains a list of policy recommendations that are meant to make policymakers aware of vital considerations in consumer behaviour that impact policy efficacy, as well as identify some specific items that inform future policy applications in the energy sector. The recommendations are empirically-validated by ECHOES work, including literature reviews, focus groups, case studies, and an international survey across 31 European nations. The policies are related to consumer action in the energy sector, and if the best practices listed here are put into widespread use, future energy policies should see higher uptake, participation and acceptance.

While ECHOES has been successful in developing a wealth of social science knowledge for the energy sector (see e.g. Pons-Seres de Brauer (2019) and the ECHOES Database), and presenting the conclusion from this knowledge in a policy-compatible way, the work of social science in the energy policy field is still just beginning. The technologies to realize a low-carbon energy transition already exists but innovations are needed to reduce the costs, to integrate all the technologies into sustainable systems, and to provide new services and market mechanisms. However, the societal willingness, and framework conditions are not yet at the level where the energy

transition will rapidly take place without significant governmental, regional and EU level intervention. Implementing the ECHOES policy recommendations on a large-scale will help to shift this dynamic, and motivate individuals and collectives to take a more active role in their energy future towards carbon neutrality.

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