



Powering Health Equity

Integrating Health for Effective
Energy Poverty Policy

ABOUT THIS PAPER

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With key attention devoted to energy policy in the new EU mandate, ensuring sustainable, affordable, and resilient energy systems is a central priority. This policy paper explores the imperative of framing and advancing actions to tackle energy poverty in residential buildings, emphasising it as a critical social, health, climate, equity and energy issue. This comprehensive approach underscores the necessity of integrating public health and health equity in energy policy, with social and environmental objectives, to achieve the Just and Green Transition. The paper focuses specifically on energy poverty and less on specific recommendations related to energy and building renovations, on which ample sources are already available. It provides concrete recommendations to European and Member State policy makers on how health can and should be more deeply integrated in energy poverty policy.

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Executive Summary

With the accelerating climate crisis, the urgency for the Green and Just Transition is greater than ever. While policies like the European Green Deal and Fit for 55 Package address energy efficiency and the transition to clean energy, they often overlook the critical social and health impacts of energy poverty. Energy poverty not only worsens health outcomes – particularly for vulnerable populations – it also creates a negative spiral in which poor health reinforces energy poverty, and vice versa.

Energy poverty is an equity issue, which means that a successful solution should be a social and inclusive one. Existing EU policies provide tools to alleviate energy poverty, but they fail to sufficiently address the combined social and equity perspectives. This is a missed opportunity. Furthermore, health perspectives are insufficiently integrated into these tools, even though they could unlock considerable health and economic benefits. Incorporating the health angle could improve well-being and reduce healthcare costs, significantly enhancing the effectiveness of energy poverty policy. By integrating health within a broader social approach, the EU can create a more inclusive, resilient system that simultaneously improves living conditions and public well-being.

To address this, we make a number of recommendations. EU energy policies must adopt a Health in All Policies approach, recognising the potential health co-benefits of addressing energy poverty (1). Energy poverty policy should be monitored through energy poverty and health indicators to evaluate the effectiveness of interventions (2). Building and energy interventions should be centred around health equity to both improve health and maximise success (3). Public health professionals should play an active role in shaping these policies through the available energy poverty intervention tools (4). These intervention tools should include strong community engagement to ensure wide uptake (5). Marginalised and vulnerable groups should be prioritised in energy poverty policy through a social determinants of health and intersectionality lens (6).

Context

Green Deal & Energy Transition: past and present outlooks

When the European Green Deal was announced, Executive Vice President of the European Commission for the European Green Deal, Frans Timmermans, framed it as a key opportunity for a transition which could lead to both improved public health and reduced inequities. Some five years after its inception, the accelerated climate crisis has only increased the need to swiftly realise a Green and Just Transition. With Russia's invasion of Ukraine, the energy crisis swiping the EU and the following launch of the REPowerEU Plan, transitioning to dependable, sustainable and affordable energy sources has become an urgent imperative for the Union. This has very much remained central at the dawn of a new decision-making cycle.

While the climate-energy nexus is well established in EU policy, health considerations often remain marginal or overlooked. This is particularly evident in energy regulations for residential buildings, despite the clear link between health, energy, and climate. Energy efficiency, access to sufficient renewable energy sources, the quality of our homes and appliances we use; all directly impact our health and well-being. Housing, in fact, is a key social determinant of health, with factors such as ventilation, moisture, dampness, insulation, indoor temperature and air quality directly influencing health outcomes.¹ The link with energy is clear, as 40%² of all energy in Europe is consumed in buildings, while 25,8%³ of final energy consumption takes place in households.

The interplay between build quality, energy availability and consumption, and health outcomes, is perhaps best illustrated in one of the European Green Deal's largest challenges; energy poverty. It has long been known that fuel or energy poverty strongly impacts health, and that it does so along a strong social gradient; the lower your income, the higher at risk you are to be in fuel poverty.⁴ The EU is very much aware of the inequity dimension of energy poverty but action is lacking and health is too often overlooked. However, climate change and the energy crisis are not only challenges of a Green and Just Transition; they are also a challenge of public health. The public health sector has a crucial role to play in the Green Deal, the question is how it can be enabled to do so.

Energy poverty in the EU

Addressing energy poverty: a snapshot of EU instruments and priorities in the current mandate

The most recent numbers show that, in 2022, 9,3% of the EU population was unable to keep its home warm. This was an increase of 2.4% since 2021,⁵ which shows the urgency of the issue. Consequently, an analysis of the latest institutional priorities indicates that energy poverty will remain a central focus in the EU. At the Council level, the Council's Strategic Agenda⁶ includes realising an Energy Union, accelerating the transition to clean, affordable energy, and meeting climate targets. President von der Leyen's initiatives, such as the European Affordable Housing Plan and the Social Climate Fund,⁷ further pave the way for a continued focus on energy poverty by aiming at facilitating access to affordable, energy-efficient housing and supporting vulnerable populations through targeted funding. Additionally, energy poverty featured prominently in the manifestos of the Party of European Socialists (PES), European Green Party (EGP), and European Left (EL) prior to the EU elections,⁸ suggesting that elected MEPs from these parties will prioritise policies to address this critical issue.

In addition, the EU has a number of legal, policy, and funding instruments already in place to realise a green and just energy transition. The 2019 revision of the Electricity Directive (EU/ 2019/944) and 2024 revision of the Gas Directive (EU/2024/1788) already covered energy poverty and access to energy. On energy efficiency, building renovations and energy poverty, the three most relevant tools to realise this are the **Regulation on the governance of the energy union and climate action (EU/2018/1999)**, the **Energy Efficiency Directive (EU/2023/1791)** and the **Energy Performance of Buildings Directive (EU/2024/1275)**.

The regulation on the governance of the energy union and climate action requires each Member State to produce National Energy and Climate Plans (NECP) every 10 years (currently running until 2030). Article 3(3d) states that an assessment must be made in these plans of the number of households in energy poverty and that objectives and policy measures on energy poverty reduction must be formulated based on that number. Article 24 further requires Member States to include energy poverty in their NECP reporting.

With the most recent update in July 2023, the Energy Efficiency Directive (EED) builds on this by providing Member States with binding targets on energy efficiency as part of the **Fit for 55 Package**. The primary objective to measure this is to achieve an **11,7%** reduction in total energy consumption within the EU **by 2030**, compared to 2020 levels. To meet this target, each Member State should set goals for a reduction of **40,5%** for **primary energy consumption** and **38%** for **final energy consumption** compared to the 2007 EU Reference Scenario projections for 2030.⁹ Though these targets are an increase from the original pledge, given the massive transformation required in the building sector, EPHA determined these targets are not ambitious enough.¹⁰

From the equity perspective, energy poverty is an important consideration. However, defining energy poverty has been a difficult issue. Therefore, the EED supports Member States through its Article 2 which defines energy poverty as follows (text underlined and made bold by EPHA):

*“‘energy poverty’ means a household’s **lack of access to essential energy services**, where such services provide basic levels and **decent standards of living and health**, including adequate **heating, hot water, cooling, lighting, and energy to power appliances**, in the relevant national context, existing national social policy and other relevant national policies, caused by a combination of factors, including at least non-affordability, insufficient disposable income, high energy expenditure and poor energy efficiency of homes”*

Furthermore, Article 8 encourages Member States to include **energy savings programmes to target energy poor households** or people otherwise vulnerable to energy poverty.¹¹ Despite this significant advancement, the Directive fails to explicitly formulate any binding commitment or targets in this realm.

The Energy Performance of Buildings Directive (EPBD) further complements the EED by focusing on improving the energy efficiency of the worst-performing building stock in the EU. As these buildings are more often inhabited by low-income households, Article 3 requires Member States’ **national building renovation plans** to include **targets and progress indicators on reduction of the number of people affected by energy poverty**. Articles 9 (minimum energy performance standards) and 17 (financial incentives) further require member states to support people affected by energy poverty with financial measures and incentives. Lastly, Article 18 requires Member States to create so-called ‘**one-stop shops**’ (technical assistance facilities for the implementation of the EPBD). These should also provide targeted support for people affected by energy poverty and people in low-income households.

Many of these measures, as outlined in the EED and EPBD, require implementation at the national level. Consequently, national building renovation plans are an important tool for action on energy poverty on the ground.

However, this is only one part of the solution; another important policy framework to look at in the context of the European Green Deal and related Emissions Trading Scheme (ETS II), is the **Social Climate Fund (SCF)**. Established on 10 May 2023 and planned to run from 2026 to 2032, the SCF is arguably the designated tool to address energy poverty in the transition to climate neutrality in Europe. The SCF provides €86.7 billion over the 2026-2032 period, with Member States to cover 25% of their Social Climate Plans and the remainder covered from the SCF.¹²

The purpose of the SCF and Social Climate Plans is to facilitate the Just Transition. That is to say that, in addition to vulnerable micro-enterprises and vulnerable transport users, it supports **vulnerable households**. This is done through measures and investments in energy efficiency, decarbonisation of heating and cooling, but crucially also through **direct income support**. This kind of support may only take place under specific terms; it is **temporary** and will **decrease over time** and may **not pass beyond 37,5% of the estimated total costs** of the Member State’s Social Climate Plan. The Social Climate Plans are further required to measure progress using specific indicators on vulnerable households and energy poverty, as well as milestones, targets and justifications.¹³ The SCF does face significant challenges in the financial feasibility of investments and measures on one side, and direct income support on the other. Both are crucial to counteract energy poverty, yet limited resources could seriously hamper those efforts, or even bring them to a standstill.

On energy poverty in particular, the European Commission provides additional guidance to Member States through the **Commission Recommendation of 20 October 2023 on energy poverty (EU) 2023/2407**.

It does so through recommendations and guidance on the **national implementation of the legal framework** (for example through the NECPs), on **structural energy poverty measures**, on measures on **affordability** and **access to energy**, on **governance** and **communication** on energy poverty policy, on **access to renewables**, on **skills and training** on energy matters, and lastly on **financing**.¹⁴

While action on energy poverty in Europe is mainly embedded within legislation, the European Commission also oversees the **Energy Poverty Advisory Hub (EPAH)**. In its own words, this is ‘an EU Initiative aiming to eradicate energy poverty and accelerate the just energy transition of European local governments.’¹⁵ As such, it provides a platform where knowledge and information on energy poverty in Europe is collected and discussed. Although not mentioned in the relevant Directives, the EPAH provides guidance to local governments and stakeholders active on energy poverty through a range of reports, guidebooks and analyses, and a store of information collected on its website. In addition to any civil society consultations the Commission conducts on energy poverty, the EPAH plays a crucial role in focusing the discussion, maintaining an ongoing policy dialogue and bringing together key stakeholders.

Energy poverty policy levers (non-exhaustive)

- The regulation on the governance of the energy union and climate action
 - Member States to assess energy poverty and define objectives and measures (Article 3)
 - Member States to report on energy poverty in their NECP (Article 24)
- Energy Efficiency Directive (EED):
 - Energy Poverty definition (Article 2)
 - Energy Savings programmes to target energy poor households (Article 8)
- Energy Performance of Buildings Directive (EPBD)
 - Targets and progress indicators on reduction of energy poverty in national building renovation plans (Article 3)
 - Financial incentives to support vulnerable households, people affected by energy poverty, or living in social housing (Articles 9 and 17)
 - One-stop shops for technical assistance in energy performance of buildings, including for energy poor households (Article 18)
- Social Climate Fund (SCF)
 - Investment in energy efficiency, decarbonisation of heating and cooling
 - Direct income support for energy poor households
 - Indicators, milestones and targets on vulnerable households and energy poverty
- Commission Recommendation on Energy Poverty
 - Guidance for Member States on national energy poverty policy implementation on:
 - Structural energy poverty measures
 - Affordability and access to energy
 - Governance and communication
 - Access to renewables
 - Skills and training on energy matters
 - Financing
- Energy Poverty Advisory Hub (EPAH)
 - Platform for exchange between key stakeholders on energy poverty

Increasing energy efficiency: the health equity angle

European legislation provides a good basis for action on energy poverty but within this, the health perspective is extremely limited. Beyond mention as a consideration, health and health equity do not play any role of significance within any of the directives. This lack of coverage is despite increasing evidence that the link between energy poverty and health is significant.

To illustrate, the regulation on the governance of the energy union and climate action does not make explicit mention of health in relation to energy poverty. In the EED, the most significant mention of health is Article 24 (4) which mentions that expert groups on alleviating energy poverty should include health actors (in addition to social and building), and Article 24 (4d) which calls for preventative measures on energy poverty, mentioning people with a **health condition** as one of them (in addition to income, gender and membership of a minority group or demographic).

The EPBD, in its preamble 38, states that the **energy efficiency first principle** has improved health and well-being as its major co-benefits. The directive further makes mention of the definition of **indoor environmental quality** in which **health** and **wellbeing** are named as the main concerns (naming examples of temperature, humidity, ventilation rate and presence of contaminants) in its Article 2 (66). This is more promising, as indoor air quality and environmental quality are also prominently featured in literature on health and energy poverty.

The SCF makes no significant mention of health beyond the preambles and the previously established definition of energy poverty. This is concerning because of the SCF's larger focus on energy poverty and the social considerations of the Green Deal.

Lastly, the Commission Recommendation on Energy Poverty does not mention health beyond the need to include health and social workers among front line workers in energy poverty programmes.

Health in Green Deal legislation (non-exhaustive)

- Regulation on the governance of the energy union and climate action
 - No mentioning of health in relation to energy poverty
- Energy Efficiency Directive (EED)
 - Article 24(4): Expert networks on energy poverty to include health experts
 - Article 24 (4d): Considers health conditions as causing increased risk of energy poverty
- Energy Performance of Buildings Directive (EPBD)
 - Article 2 (66): Defines indoor air quality with health and wellbeing as main concerns
- Social Climate Fund (SCF)
 - Lack of coverage on health beyond energy poverty definition
- Commission Recommendation on Energy Poverty
 - Inclusion of health and social workers in training programmes for front line workers in energy poverty and green energy solutions

Macro-level

The lack of inclusion of the health perspective in the Green Deal is concerning, but also surprising given that the co-benefits between health and the transition to clean energy are well-researched and well-established. When approaching this, two concepts should be kept in mind. One is the concept of **One Health**, which recognises that human health is closely linked to the health of animals and ecosystems as well.¹⁶ The second is the **Health in All Policies** approach, where action should take place across sectors, not just the healthcare sector, if health is to be improved.¹⁷

This is underlined by the intricate link between climate and health, with energy poverty as an issue which can help illustrate the effects of climate change on health. Take extreme weather events related to climate change. Households experiencing energy poverty – especially those living in older or poor-quality buildings – often experience **power shut offs**, while extreme weather may cause further **service interruptions**. Research has shown that both have **direct impacts on health** and that people with chronic conditions (such as cardiovascular, respiratory or renal) may be forced to seek medical care during shutoffs or interruptions, **increasing hospitalisation rates**. In fact, that same research shows that **all cause and external-cause mortality rates** are overall higher during power-outage periods, especially when caused by extreme weather events.¹⁸ This already shows how much there is to be gained with a health perspective on climate change.

The climate and health link is also covered in emerging research on **summer energy poverty**. Where previous research focused mainly on cold climates, issues with energy poverty and heat are equally important in the context of climate change. The Cooltorise project has explored this topic and found that energy poverty and extreme heat have a large impact on **heat-related mortality**, but that solutions to this are insufficiently researched.¹⁹

Another example – as quoted in an EPHA paper – is **air pollution**, commonly believed to be the **largest environmental health risk** in Europe, with many studies showing a **higher concentration of pollutants indoors** than outdoors. Building renovations are therefore not only an effective way of **climate change mitigation** but will also lead to lower energy bills and increased health and wellbeing. If those health benefits are to be maximised, then a health and equity perspective needs to be part of a holistic approach.²⁰

There is not only a health and well-being argument to be made for this inclusion, but also an economical one. Research from southern Europe shows that people in energy poverty make **more frequent use of health services**, for example emergency services, primary health care, nursing and hospitalisations. In addition, people in energy poverty make **higher use of medication**, such as **antibiotics, painkillers and asthma medication**.²¹

As stated before, the Social Climate fund tackles energy poverty through **measures and investments** in energy efficiency on one side, and **income support schemes** on the other. Those income support schemes are subject to very strict time and budget limitations, presumably to avoid quickly rising costs. At the same time, by only focusing on the expenses the large potential benefits are completely overlooked.

The health perspective, currently underexposed, provides an important piece to this puzzle. Take for example the fact that the Buildings Performance Institute Europe estimated that energy renovations in hospitals have the potential to **reduce hospital stays by 11%**, leading to potential savings of up to **€45 billion** per year in the healthcare sector. That same study further showed that, in France, medical costs the equivalent of **€930 million a year** could be linked to **poor housing and ill-health**, which may further **cost the French economy** as much as **€20 billion a year**.²²

In relation, research from Spain shows that energy renovations in energy poor households have the potential to lower the amount of people with bad or very bad self-perceived health by **100.000** and people with **cardiovascular disease** by **about 120.000**. With an investment of between **€16,3** and **€18,454 million** healthcare systems could save up to **€558 million per year**. Needless to say, such investments leading to improved indoor air quality through ventilation, heating or cooling would already bring massive health and economic benefits, but that would require health considerations to be clearly included in renovation investments and measures.²³

Micro-level

Health, well-being and economic arguments are an important consideration when looking at the bigger picture, but equally important is the health perspective of energy poverty on the **household level**. Energy poverty has a very real effect on the individual level, and a successful approach requires a clear understanding of what these effects look like so they can be addressed.

The link between personal health and energy poverty is very pronounced, with each part of a mutually reinforcing negative spiral. Though the causes for energy poverty are complex, recent research shows that poor health and energy poverty are in a so-called 'bi-directional causal relationship',²⁴ a vicious cycle where energy poverty can cause poor health status, while high healthcare costs from poor health status can partly cause energy poverty. This effect has a strong social gradient, based on non-medical factors that influence our health, such as our employment, age, level of education, and **housing**, also referred to as the **social determinants of health**.²⁵ Though there are plenty of examples of how housing influences health, data on quality of housing by income groups is extremely scarce in Europe.

Differences in quality of housing are, however, well-documented on the Member State level. Eurostat data, for example, shows stark disparities between countries with the **poorest quality housing** and **inability to keep the house warm** concentrated in **southern and eastern Europe**.²⁶ Further, data from the UK shows that, in England, people from lower income quintiles are more likely to live in non-decent housing. For example, **18% of people from the lowest income quintile** live in non-decent housing, versus **10,8% of people in the highest income quintile**.²⁷ Another factor to consider is the **energy ladder**, a theory suggesting that **wealthier households are more likely to use efficient and less polluting energy sources** than poorer households.²⁸ In relation, there is a number of health issues that can be discussed. Research shows that issues related to energy poverty (such as **arrears on utility bills**, the **inability to warm the home**, or **high health expenditures**) **cause a lower health perception**.²⁹ High health expenditures are a point of significant concern, as poorer health may lead to higher healthcare costs (and vice versa), thus decreasing the ability to pay for utilities.

In addition, when speaking of poor housing quality and health, **Indoor Air Quality (IAQ)** is an important metric, where some of the most important considerations are:

- Microbial pollution and damp
- Air temperature
- Building design and ventilation

These three considerations are linked to very concrete health issues. The health effects of **microbial pollution** and **damp** are complex, but have been linked to issues with **respiratory health**, **allergies** and **asthma**. Both low and high **air temperature**, pose large risks to health. **Low air temperature** is proven to

increase risk of respiratory conditions, while **high temperatures** may cause issues with **cardiovascular health**. Finally, **building design** and **ventilation** are crucial for **diluting or removing pollution** which is an important determinant for IAQ.³⁰

Dampness and mould can lead to **wheezing, asthma, respiratory tract infections (RTI)**³¹ and **bronchitis**³² as well as a higher risk of **musculoskeletal** and **cardiovascular disease**.³³ In turn, high energy costs and arrears on utility bills caused by poor housing or energy poverty can also lead to **stress** and **mental ill-health**,³⁴ once again underlining the vicious cycle of poor health and energy poverty in the context of poor quality housing. In relation to the energy ladder, we can state that people with lower socio-economic status and people in energy poverty may be more likely to use traditional or solid – and thus more polluting – fuels, while they may also be more likely to live in poorer quality housing. This exposes them disproportionately to health risks, for example to **indoor air pollution**. Energy poverty interventions must take these kinds of health issues into account, as the strong social dimension of housing and energy poverty can cause large health inequities.

Recently, two Horizon 2020 EU projects have shed more light on the relationship between energy poverty and health equity; **EmpowerMed** and **WELLBASED**. Research from EmpowerMed showed that people that are affected by energy poverty more often indicate they have a **longstanding illness or health problem** than people that are not affected by energy poverty (**54% vs 37%**). The most often mentioned chronic health issue is **high blood pressure**, followed by **migraines**, and **depression or anxiety**.³⁵

These findings are reflected in the research of the WELLBASED project, in which a survey with 356 respondents was held, **59% of whom earn less than €750 per month** and only attended lower secondary education. The **incidence of energy poverty was considerably higher** than that reported in the EU energy poverty statistics for 2021. Further, they found that **62,5% of respondents feel anxious or depressed**, **30% were told by a doctor that they have lung disease**, and **29% avoided healthcare because of costs**,³⁶ though the link with energy poverty is not explicit.

On the one hand, this shows the clear effects of energy poverty on health (and vice versa), but on the other hand this also shows that more research is required to understand the wider health effects of poor-quality housing, energy poverty and health. Furthermore, this points to the need for strong policy and monitoring frameworks, based on health indicators that are linked to energy poverty. National Energy Poverty Observatories could collect data on these indicators and monitor health and energy poverty.

Health risks of energy poverty (non-exhaustive)

- Energy poverty generally: poorer health perception
- Microbial pollution and damp: Increased risk of respiratory disease, allergies and asthma
- Dampness and mould: increased risk of wheezing, asthma, respiratory tract infections (RTI), bronchitis, musculoskeletal and cardiovascular disease
- High temperatures: increased risk of cardiovascular disease
- Utility bill arrears: increased risk of mental ill-health or depression
- Health equity
 - Lower income groups more likely to live in non-decent housing
 - Energy Ladder: poorer households more likely to use less and efficient, more polluting energy sources
 - Income or chronic conditions increasing risk of energy poverty

The Just Transition: centring health equity considerations

With an understanding of the policy levers and the relationship between poor housing, energy poverty and health outcomes, the only question that remains is how this knowledge is translated to action. There can be no doubt about the importance of health in energy poverty policy, but policy makers need to be aware of how health can be incorporated into **energy poverty interventions**. A number of considerations and tools for interventions are named, including energy and housing renovations, renewable energy communities, one-stop shops, and the need to consider the needs of specific groups.

One may assume that **housing** and **energy renovations** will indirectly improve health outcomes, and that an additional health lens is not required. Though building or energy renovations will likely lead to increased indoor air temperature, reduced humidity and lower energy bills (among other things), in reality positive health effects do not automatically follow in all cases. Research conducted in the context of the WELLBASED project concluded that, due to **budgeting priorities**, a household may prioritise savings from energy renovations to pay for things other than increased warmth. This would mean that the positive health effects of renovations are mitigated.

To counteract this, renovations should **not have a purely technical approach** but should also include a **community engagement aspect**.³⁷ For example, healthcare and social care professionals could facilitate access to appropriate resources for energy poor or vulnerable households, maximising the positive effects of renovations. Similarly, health and social considerations (such as household finances, nutrition and lifestyle) in relation to the social determinants of health could be included in household or community engagement. An example of this is interventions done in the context of WELLBASED in Valencia, where energy vulnerable citizens could attend sessions on healthy food, mental well-being and the relationship between energy poverty and health.

It must also be considered that many households may be excluded from renovations in the first place. The energy needs of a household can wildly differ, impacting their eligibility for renovations (e.g. households that require heating versus households that require cooling), or because their energy spending is higher because of household size (leaving smaller households with **relatively higher energy spending** behind).³⁸ Even when people are **homeowners**, they may be susceptible to energy poverty. This is the case for example with **multi-family apartment buildings** particularly in Central and Eastern Europe, where – despite owning a home – households may not be eligible for energy renovation subsidy schemes. This means that specific support may be required.³⁹ In more simple terms, energy and housing renovation interventions need to strongly consider **why an individual or households suffers from energy poverty** and adjust their interventions accordingly. Doing so based on the Health in All Policies principle, means that energy poverty interventions should include a methodology that considers the social determinants of health perspective. The WELLBASED project is developing such a methodology for urban interventions.

The Renewable Energy Directive (REDII, and recently revised in REDIII) makes mention of so-called **renewable energy communities** which bring together stakeholders in renewable energy projects, including household customers.⁴⁰ Each Member State is required to explore possibilities for the creation of renewable energy communities, and Article 22 of REDII sets out the terms of such energy communities. No mention of energy poverty or health is made in this context. In fact, research shows that the social benefits that could come from energy community implementation are often overlooked, completely ignoring the **social return of investment**.⁴¹ This is a missed opportunity, as energy communities could be spaces which bring together many actors such as the health sector, but also the social, energy and housing sectors, significantly improving the effectiveness of energy communities. There is an important role here for governments, NGOs and the private sector to remove barriers for low-income or vulnerable households in creating energy communities.⁴²

The potential for benefits are important to note. In the Netherlands, for example, **personalised services** in energy community proved to be effective in combatting energy poverty, especially when combined with state interventions focused on financial relief and structural improvements in building quality.⁴³ A combination of these approaches can become very expensive for governments, which may lead to this approach not being popular. However, the discussion on the social return of investment should be central, as it has been previously stated that investments like these can lead to social benefits which can lead to massive financial benefits in healthcare savings alone.

Another important tool is so-called **one-stop shops (OSS)** which support homeowners through technical assistance with energy renovations. OSS are identified in the EPBD under Article 18, while Article 9 includes one-stop shops as a tool to support vulnerable households and people living in social housing.⁴⁴ The guidelines for these one-stop shops are not yet available, meaning it is unclear how they are designed. Despite this, OSS have been created across Europe in support of the renovation wave, as well as networks bringing them together. There is still plenty of room for further learnings on how to improve them when it comes to energy poverty, especially on the sociological perspective,⁴⁵ such as the community, social and health considerations.

As it stands, OSS can improve renovation processes in many ways, one of them being supporting a **tailored approach** to specific needs and concerns of homeowners, including among vulnerable groups. To be successful OSS should be part of a wider range of measures addressing energy poverty.⁴⁶ Neither health, nor social issues have been researched much in this context. Particularly for **community empowerment**, OSS are crucial as they may also be platforms for energy poverty alleviation through soft measures like behaviour changes or smaller scale interventions.⁴⁷ Research from Portugal showed that OSS were used for community capacity-building and to facilitate building renovations, but that the majority of people are not aware or do not make use of their services. There is, however, much to be gained from the wider roll-out of OSS in building renovations. This is the case especially in vulnerable households, where efforts of OSS can support in improvement of energy efficiency, comfort conditions and health.⁴⁸ As one-stop shops are more broadly rolled out, they should also include services and materials to see to the needs of households where there are vulnerabilities related to health concerns. This, as part of a wider range of materials that cover the social needs of those households.

The examples named point to a crucial consideration; Member States should ensure a **multilevel governance approach** to energy poverty interventions. This ensures that that local and regional realities, as well as the needs of individual households are more effectively identified and addressed. Such a multilevel governance approach should be applied to all energy poverty policy. One example is through the inclusion of **social** and **health targets** in the National Climate and Energy Plans to ensure implementation and monitoring.

Underlining these approaches are considerations related to the social determinants of health. In the context of health equity and energy poverty, certain groups face a disproportionate risk of energy poverty and thus may be more exposed to negative health effects. Particularly **gender**, **race** and **ethnicity**,⁴⁹ **age**,⁵⁰ **disability**⁵¹ and **medical vulnerability**⁵² are underexposed in energy poverty policy and research. The effects of energy poverty on health may manifest in different ways across these groups. Heat stress, navigating medical certifications and financial subsidies, clean cooking, and health conditions causing increased vulnerability to energy poverty,⁵³ all are social and health equity considerations which remain underexposed due to a lack of inclusion of a public health and health equity perspective.

Conclusions and recommendations

With the effects of the energy crisis and climate change, the EU faces a significant challenge in ensuring that all Europeans have the means to heat and cool their homes. The energy transition, renovation of Europe's building stock and increasing energy poverty all point to the need for a Green and Just Transition. It is clear that the social and equity perspectives are crucial. At the same time, the health implications are barely considered in policies meant to address these crises. This ignores the reason for why energy and building renovations take place in the first place; renovations are not done from a simple desire to improve living comfort; they are first and foremost necessary measures to ensure we can live healthy lives in our homes.

The evidence is clear, a vicious cycle exists in which energy poverty exacerbates poor health, while poor health partly causes energy poverty; the bi-directional causal relationship. This fact alone shows that relevant EU policy – the Energy Efficiency Directive, Energy Performance of Buildings Directive, Renewable Energy Directive, Emissions Trading Scheme and Social Climate Fund – should all include a public health and health equity perspective as part of an integrated social approach to energy poverty. A successful European Green Deal includes a Just Transition, and a true Just Transition should be social, centred around the social determinants of health.

Based on the findings of this paper, the European Public Health Alliance makes the following recommendations:

1. Integrate health in all of the EU's relevant energy poverty policy instruments based on the **Health in All Policies (HiAP), One Health** and **energy efficiency first** perspectives, including;

- Recognition of the importance of health in the **Fit for 55 Package** (e.g. **Energy Efficiency Directive, Energy Performance of Buildings Directive, Emissions Trading Scheme, Renewable Energy Directive**) and the **regulation on the governance of the energy union and climate action**;
- **Social Climate Fund**; recognise health in tandem with social benefits in the SCF as the designated policy instrument to combat energy poverty;
- Emphasise the health **co-benefits** in energy poverty legislation more explicitly, particularly the **large economic savings in healthcare costs**;
- Consequently, explore possibilities to use economic savings to continue **direct income support** in tandem with energy poverty measures and investments to maximise the effect of energy poverty policy;

2. Expand energy poverty monitoring frameworks to **monitor** progress of renovations and interventions through National Energy Poverty Observatories, collecting data based on energy poverty and **health indicators** including but not limited to;

- Health perception;
- Use of health services; use of primary care; visits to general practitioner (GP);
- Hospitalisation rates;
- Medication rates;
- Changes in disease rates (e.g. cardiovascular, respiratory and musculoskeletal);
- Mental health and depression rates; sleeping rates;

3. Centre **health equity** in **buildings and energy interventions**, making sure they consider health impacts through a number of metrics, including but not limited to;
 - Indoor air quality (IAQ);
 - Heating and cooling;
 - Power-outage or power cut-off rates;
 - Arrears on utility bills and mental health and depression;

4. Recognise, include and support **public health professionals** and **researchers**, and **healthcare** and **social workers** more explicitly in cross-sectoral multilevel governance-based **energy poverty interventions**;
 - Interventions to include a **methodology** based on the **social determinants of health** (such as the one in development in the WELLBASED project)
 - **Housing** and **energy renovations** to move from a purely technical perspective to including a social and health perspective;
 - **Renewable Energy Communities** to include public health professionals to emphasise the **social return on investment**;
 - **One-stop Shops** to develop tailor-made approaches to specific health and energy poverty needs;

5. Strengthen **community engagement** in energy poverty interventions to ensure wider uptake and a better understanding of the social and health implications of energy poverty;
 - Utilise energy poverty interventions to **identify health needs** and support vulnerable and energy poor households in accessing **tailor-made energy and building renovations**;
 - **Capacity-building activities** for healthcare and social care professionals to identify energy poverty situations and refer households to relevant resources in the community or public sector;
 - Special technical assistance should be given to **homeowner associations** with energy poor households to ensure scaling up of energy efficiency renovation of owner-occupied multi-apartment buildings;

6. Prioritise **marginalised** and **vulnerable groups** in **energy poverty interventions** through a social determinants of health and intersectionality lens, particularly in funding through the **Social Climate Fund**, identifying and serving needs along lines of;
 - Socio-economic status;
 - Medical vulnerability or chronic conditions;
 - Gender;
 - Age;
 - Race and ethnicity

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