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Abbreviations

ACRP	Austrian Climate Research Program
NEHG	Austria's National Emissions Certificate Scheme
EIWG	Electricity Industry Act
EnDG	Energy Poverty Definition Act
EU-ETS	EU Emissions Trading System
PV	Photovoltaic

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1 Impact of selected climate policies on vulnerable groups and recommendations for avoiding adverse effects

Austria has committed to achieving climate neutrality by 2040 and to supplying 100% renewable electricity by 2030. Delivering on these climate goals is changing what households pay for energy through each of three channels: i) carbon pricing outside the EU Emissions Trading System (EU-ETS), ii) rapid solar photovoltaic (PV) expansion reshaping how the electricity grid is funded, and iii) the phase-out of fossil heating systems.

While each of these policies is justified when dealing with climate change, they may also have an adverse impact on household budgets, with vulnerable groups at risk of being affected the most under an adverse redistribution of energy costs through these policies. Meanwhile, the cushioning support for vulnerable households has declined in recent years. The electricity price cap and levy reductions expired at the end of 2024, and the Klimabonus was cancelled in 2025. The Energy Poverty Definition Act (EnDG) of December 2025 and the social electricity tariff introduced by the Electricity Industry Act (EIWG) are the new backbones of social protection.

Work Package 2 of the ADJUST project analyses these three policy areas using Austrian household microdata, smart meter data and a comparative review of energy poverty definitions. The findings converge on one point: who is exposed to transition costs is determined less by income than by housing, heating technology, tenure and location.

2 Key messages

- **Income is a weak proxy for identifying vulnerable groups.** More than 90% of the dispersion in carbon tax burdens occurs within income deciles, not between them. Housing size, heating system, vehicle ownership and settlement structure explain roughly one-third to one-half of that within-decile variation. Thus, carbon tax is related to horizontal (structural) rather than vertical (income-related) inequality.
- **The Klimabonus substantially mitigated vertical inequality, but not horizontal inequality.** It turned a regressive gross carbon tax into a mildly progressive net burden. Its cancellation restores gross regressivity, but simply reinstating a flat, regionally graded transfer would still leave structurally exposed households undercompensated.
- **Solar penetration shifts grid costs onto households that cannot afford rooftop PV.** Under current volumetric network tariffs, households without PV are simulated

to pay roughly EUR 110 to EUR 180 more per year by 2040. This is around 15% to 25% above their benchmark network bill, as projected PV uptake rises from 25% to 75% of households.

- **Capacity-based tariffs will not resolve the inequality created by rising rooftop solar installations.** Household peak demand is only weakly related to annual consumption, so load-based charges redistribute network costs rather than removing the cross-subsidy, and they can leave low-consumption households worse off. A charge on electricity fed into the grid can help to restore the benchmark allocation and compensate poor households that cannot afford their own solar installations.
- **The gas phase-out creates a second, potentially sharper cost-allocation problem.** Fixed gas network costs must be recovered from a shrinking customer base. If better-resourced households disconnect first, tenants, apartment dwellers and low-income owners are left carrying the residual network costs of an infrastructure that they cannot afford to leave.
- **The EnDG is a strong foundation that is not yet complete.** It already defines energy poverty by enumerating essential energy services, including cooling. However, cooling is neither measured nor supported by any instrument; consumption rationing is not tracked continuously, and mobility is not fully covered by the framework.
- **The binding constraint in terms of funding support for household-level energy installations is often access, not funding volume.** Three filters keep support payments from reaching targeted households: (i) they are paid ex post, so a household must front five-figure costs for a boiler replacement before any reimbursement arrives; (ii) they presuppose ownership, excluding tenants, who show the highest prevalence of energy poverty but cannot authorize work on the building; and (iii) they assume administrative capacity that households under pressure do not have.

2.1 Carbon pricing and household inequality

Austria's national emissions certificate scheme (NEHG) began in October 2022 at EUR 30 per ton of emissions, rising to EUR 55 per ton in 2025. Using the Household Budget Survey

2019/20, ADJUST converted household fuel spending into physical quantities, applied the statutory emission factors and simulated tax liabilities household by household.

The headline distributional result is familiar: the gross carbon tax is regressive, because lower-income households spend a larger share of income on energy. The Klimabonus – a flat base amount plus a regional supplement of EUR 0 to EUR 145 reflecting infrastructure and public transport availability – reversed this, rendering net incidence mildly progressive and overcompensating most households in the lower deciles. The clearest result comes from studying the variance decomposition. Whereas about 80% of the variance in household income sits between income deciles, only about 7% of the variance in carbon tax incidence does. The remaining 93% is dispersion within deciles. Households on almost identical incomes face very different carbon bills. Decile-by-decile regressions attribute between roughly 31% and 52% of that within-decile variation to observable structural characteristics: dwelling size, building vintage, tenure, heating system, number of cars and settlement category.

Thus, inequality relates to durable capital stocks and infrastructures that fix short-run consumption choices and is, therefore, of a horizontal (structural) rather than a vertical (income-related) nature. A household in a large, poorly insulated dwelling with oil heating and private cars in a rural municipality is exposed to carbon pricing in a way that no income-based instrument can detect. This is the central design implication: an income-calibrated transfer can achieve vertical fairness while leaving horizontal inequity untouched.

2.2 Cost of network tariffs for households without rooftop PVs

Austrian PV capacity has grown by more than 35% per year since 2004 and reached around 9 GW in 2025. Grid fees already accounted for close to half of the retail electricity bill of an average household in January 2026, and network tariffs are projected to rise further. The ADJUST simulation assumes a 133% increase between 2025 and 2040 (i.e. an average increase of 5.8 per cent per year) as the grid is rebuilt for renewables and electrification.

Because network tariffs are predominantly based on energy use, rising PV self-consumption reduces the amount of electricity over which network costs are recovered.

Simulating 800 Upper Austrian households' 15-minute smart meter profiles against synthetic PV generation profiles, ADJUST finds that, by 2040, households without PV pay approximately 15-25% more than their benchmark network bill as PV uptake rises from 25% to 75%. In our sample, a 133% increase in each of the tariff components (fixed charges, grid usage and losses) raises the annual tariff from EUR 313 to EUR 729 in 2040, assuming electricity consumption remains at the 2025 levels. For non-PV households, this represents an additional EUR 110-180, as PV uptake rises from 25 to 75%. The average Upper Austria household in our sample has a lower annual tariff but a higher annual electricity consumption than the Austrian average: EUR 313 and 3906 kWh, compared with EUR 389 and 3500 kWh for overall Austria in 2025. Therefore, the tariff increase due to higher PV uptake may be proportionately larger when calculated from the Austrian average tariff of EUR 389.

Households without PV are the vulnerable group here in a precise, tariff-related sense: they cannot reduce their contribution to grid cost recovery, while remaining fully exposed to the resulting tariff increases. That group overlaps substantially with households facing socio-economic constraints – limited capital, no suitable roof, or tenancy in a multi-family building.

The reform most actively discussed is shifting a share of network cost recovery onto measured peak demand. However, this does not solve the problem since peak demand is only weakly correlated with annual consumption. Our findings suggest that both linear and tiered load-based tariffs mainly redistribute costs across households; in the simulations, higher load-based shares sometimes increased the additional burden on non-PV households, and low-consumption households were often worse off. The one design that fully restored the benchmark was a charge on electricity fed into the grid, at 5.3, 4.2 and 3.5 ct/kWh in the 25%, 50% and 75% scenarios respectively. For comparison, the EIWG introduces a feed-in charge below 0.05 ct/kWh for installations above 20 kW — a different instrument at a different scale, but an indication of how far current policy is from neutralizing the cost shift. Feed-in charges also trade off against investment incentives, which is why a hybrid of moderate load-based elements and a carefully calibrated feed-in component is the more promising direction.

2.3 Increasing burden of a shrinking gas network

The gas case differs from the electricity one in mechanism. PV households stay connected; households that replace a gas boiler disconnect entirely. Around 850,000 gas boilers and 450,000 oil boilers were still in operation in 2024. As the customer base shrinks, the largely fixed costs of operating, maintaining and securing the gas network fall on those who remain.

Opportunities to leave are unequally distributed. Owner-occupiers of single-family homes can decide alone; tenants and apartment dwellers depend on landlords, multilateral building owners on collective decisions; low-income households cannot finance the upfront investment even where lifetime costs would fall. If less constrained households exit first, the sequencing itself becomes regressive, and the effect is amplified where tariffs remain volumetric and where remaining customers are geographically dispersed, keeping infrastructure costs high even as the volume of gas throughput diminishes. In summary, gas network regulation, heating policy and social policy have to be coordinated, or the phase-out will raise energy costs precisely for the households least able to escape them.

2.4 Energy poverty: walking the path from definitions to policy mechanisms

The EnDG of December 2025 provides Austria's first legal definition of energy poverty and defines it by enumerating services – electricity, heating, hot water, cooling, cooking, lighting and the operation of household appliances – rather than fuels. This is an appropriate conceptualization for a decarbonizing system: consumers care about a warm home (a service), not affordable gas (a fuel commodity that may help to deliver a service but not exclusively so).

However, the service logic is not yet carried into measurement and instruments. For example, cooling is in the legal definition but has no regular indicator and no dedicated support instrument (for example, a subsidy on air conditioners or other cooling technologies), even though roughly 46% of people in Austria reported physical strain from heat in 2023, with clearly higher shares among people at risk of poverty, tenants and residents of Vienna and densely built areas. Further, the type of services poverty varies by location. Domestic energy poverty in Austria is predominantly urban, highest in Vienna at around 19% and 17% in other densely populated areas. On the other hand, transport-related deprivation concentrates in rural and peripheral areas where public transport and

charging infrastructure are scarce. Mobility therefore should not be folded into the EnDG, where statistical and support logic is household energy. As an alternative, it should be monitored in coordination with the transport poverty assessment required under the Social Climate Fund, so that households deprived in either or both domains become visible.

Finally, the delivery gap is well documented. Based on the stakeholder consultations conducted under ADJUST and the 2026 energy policy review by the International Energy Agency, most low-income families cannot access Austria's renovation and heating subsidies because support is paid ex-post and requires upfront payment, and many are ineligible because they do not own their homes. The workshop participants call this a trickle-down problem due an implementation gap in the policy. Further, many low-income, energy poor households do not have the necessary administrative capacity to avail the subsidy and may face information barriers in availing the subsidy. As a result, the binding constraint is not always the means of funding but its accessibility for tenants, for households without liquidity for pre-financing, and for households outside the information channels through which support is communicated.

3 Policy recommendations

1. **Target structural exposure, not income alone.** Combine income screening with observable structural markers like building vintage, dwelling size, heating system, tenure, settlement category and car dependence to identify target groups under the EnDG. Recognize that barrier categories (pre-financing, tenure, information and administrative) intersect across services and need comprehensive targeting to mitigate structural exposure
2. **Decide the use of carbon revenues before EU ETS 2 takes effect.** No designated use of national carbon pricing revenue has been announced since the Klimabonus was cancelled, while ETS 2 will extend carbon pricing to buildings and road transport from 2027. Any successor of the Klimabonus should combine a transfer component with structural support to reduce fossil fuel dependency, and Austria's Social Climate Plan is the natural vehicle for both.
3. **Reform network tariffs to protect non-PV households from higher grid costs.** Charges based on peak demand (i.e. load-based tariffs) may better reflect grid use,

but they will not stop shifting the cost to disadvantaged households that use little electricity overall.. Evaluate hybrid designs that combine moderate load-based elements with a calibrated feed-in component and assess each option against a stated benchmark: that households without PV are not made worse off by the adoption decisions of others.

4. **Sequence the gas exit and decide now who pays for the residue.** Prioritize heating-replacement support for constrained households so that they leave the gas network early rather than last; use coordinated municipal heat planning to identify where decommissioning is feasible; and adjust residual cost recovery rules so the burden is not concentrated on a shrinking, increasingly vulnerable customer base but rather socialized more broadly where continued gas use reflects structural constraint rather than choice.
5. **Complete the service logic of the EnDG in measurement and instruments.** Give every service named in the EnDG at least one regularly collected indicator; add a summer cooling indicator; make the consumption-restriction question a standing part of monitoring; create a support and advice line for summer heat protection prioritizing passive measures in urban rental housing; extend price transparency and dispute resolution obligations in district heating; and establish a coordinated data view with the transport poverty assessment without merging the two definitions.
6. **Design every instrument for access and apply an efficiency-first sequence.** Four principles: no pre-financing (direct payment to installers, vouchers, in-kind delivery); tenure-neutral variants so tenants are not structurally excluded; administrative simplicity with assisted application as the default; and outreach through trusted intermediaries. Structural measures that permanently lower the cost of a service should take precedence over recurring payments, with income-side instruments such as the social tariff retained as the bridge for households whose service costs cannot be reduced quickly.

4 Caveats and limitations to consider

The carbon tax analysis is an ex-ante simulation on 2019/20 expenditure data: quantities are held fixed, behavioural responses are not modelled, and only direct emissions from

heating and transport are covered. The tariff analysis uses 800 households in Upper Austria, which over-represents owner-occupied, rural and larger dwellings; it is static, excludes electric vehicles, heat pumps and storage, and treats PV adoption as exogenous. The gas-network discussion is conceptual rather than quantified. The results should be read as evidence about mechanisms of cost allocation, not as forecasts of household bills.

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