



HIA Submission: Inquiry into Residential Electrification

Senate Economics References
Committee

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Simon Croft

Chief Executive – Industry and Policy

Housing Industry Association

79 Constitution Avenue

Campbell ACT 2612

Phone: 02 6245 1300

Email: s.croft@hia.com.au



About the Housing Industry Association

The Housing Industry Association (HIA) is Australia's only national industry association representing the interests of the residential building industry, including new home builders, renovators, trade contractors, land developers, related building professionals, and suppliers and manufacturers of building products.

As the voice of the industry, HIA represents some 60,000 member businesses throughout Australia. The residential building industry includes land development, detached home construction, home renovations, low/medium-density housing, high-rise apartment buildings and building product manufacturing.

HIA members comprise a diversity of residential builders, including the Housing 100 volume builders, small to medium builders and renovators, residential developers, trade contractors, major building product manufacturers and suppliers and consultants to the industry. HIA members construct over 85 per cent of the nation's new building stock.

HIA exists to service the businesses it represents, lobby for the best possible business environment for the building industry and to encourage a responsible and quality driven, affordable residential building development industry. HIA's mission is to:

“promote policies and provide services which enhance our members’ business practices, products and profitability, consistent with the highest standards of professional and commercial conduct.”

The residential building industry is one of Australia's most dynamic, innovative and efficient service industries and is a key driver of the Australian economy. The residential building industry has a wide reach into manufacturing, supply, and retail sectors.

The aggregate residential industry contribution to the Australian economy is over \$150 billion per annum, with over one million employees in building and construction, tens of thousands of small businesses, and over 200,000 sub-contractors reliant on the industry for their livelihood.

HIA develops and advocates policy on behalf of members to further advance new home building and renovating, enabling members to provide affordable and appropriate housing to the growing Australian population. New policy is generated through a grassroots process that starts with local and regional committees before progressing to the National Policy Congress by which time it has passed through almost 1,000 sets of hands.

Policy development is supported by an ongoing process of collecting and analysing data, forecasting, and providing industry data and insights for members, the general public and on a contract basis.

The association operates offices in 22 centres around the nation providing a wide range of advocacy, business support including services and products to members, technical and compliance advice, training services, contracts and stationery, industry awards for excellence, and member only discounts on goods and services.



1. Introduction

The residential building industry recognises that the Federal Government and in turn State and Territory Governments have made commitments on future energy settings. HIA and our members are committed to working with Government to deliver on these commitments and ensure they are delivered in a practical and affordable manner for the industry and homeowners.

On behalf of the Housing Industry Association (HIA) the following submission to the Economics References Committee inquiry on residential electrification, is prepared with the residential building industry's perspectives on the Committee Terms of Reference.

Electrification of future homes is a worthy consideration, though it should not be viewed as an objective in and of itself, but an option among alternatives to achieve decarbonisation. If wide scale change to electrification is to occur, transition must be appropriately managed to limit negative impacts.

This inquiry provides an important opportunity to consider this issue holistically as the issue has broader reach than just swapping out of future homes, for example, gas cooktops for induction cooktops.

A change of this nature effects not only choice of products that can go into a home, but also supply chains, energy supply and security, work force changes and work force skills, existing products and existing homes, codes and standards among other considerations.

Therefore, in undertaking this inquiry it is important that it considers both opportunities and risks and second order effects associated with household electrification.

Any policy must also consider current workforce pressures on labour supply and timing to deliver outcomes.

1.1 Overview

For the purposes of this submission, home electrification is taken to mean reducing a new dwelling or existing dwelling's reliance from solid fuel or fossil fuel to fully electric regulated fixed appliances powered either from the grid or Distributed Energy Resources (DER).

Inquiry Terms of Reference

The inquiry Terms of Reference (TOR) are specifically focused on upside opportunities, it is equally important to also discuss the risks, the practical implications and key transitional issues for builders, suppliers/manufacturers and in turn homeowners that must be addressed if wide scale change is to occur.

Any benefits for full electrification would introduce both costs and risks.

Therefore, it is critical that any policy consideration of electrification must not overlook technical, behavioural and administrative responses for homes and apartments that affect outcomes, industry and manufacturers.

Encouraging electrification must not be at the expense of flexibility in meeting objectives while encouraging innovation in a stepwise approach to stringency.



Consumer choice and innovation

Consumer choice in what can and can't be included in an individual's own private home remains a vital matter and Government intervention into this matter must be approached with caution.

The current energy market is dynamic and there are a range of fuel types in the market and it is expected that given the right policy settings this area will continue to advance quickly with more choices and options.

These different fuel types, including more renewables gases and other alternatives are safe and reliable and currently the lower emissions alternative in many states and a contribute to reliable supply, particularly in winter as a proven source of heating, hot water and cooking.

Homeowners must be able to continue to choose the appliances they wish to install from a range of sources/products under an outcomes-based approach. Domestic manufacturers have a role in meeting demand as imports have been shown to be fragile in the face of supply disruptions and can contribute to cost inflation.

Innovation

HIA broadly supports innovations and new technologies, new opportunities, new products and greater choice in products and systems for builders and home owners.

A large part of our advocacy work across multiple policy areas, requires us to work with relevant industry sectors to break down regulatory barriers that may restrict new products or technology entering into the market to provide more choice for industry and homeowners.

Energy transition must be done at a national level and industry must be a key player in designing the policy and how it could be practical applied and be developed in a holistic manner.

Any initiatives resulting in wide scale change, must be done so in a staged approach to ensure a smooth transition that accommodates current consumer choices, costs and existing investments in infrastructure by developments.

Robust regulatory impact assessment and stakeholder consultation

Any proposals for wide scale change must be supported and underpinned by a robust regulatory impact assessment process, that considers all available options and assesses the full range and scale of costs and impacts for a change for household electrification.

Such a policy assessment must recognise the current voluntary uptake of greater household electrification, the role and cost of storage, both DER and networks, complexity, cost and behavioural changes and social licence required to achieve full integration.

Replacing current demand served by gas adds pressure to new supply and is likely (all other factors being equal) increase the need for network investment, retraining and changes in supply chains.

It is also important to take into consideration the broad range of stakeholder views and undertake regulatory analysis of potential impacts were one fuel source to be supported over another.



The policy objectives and assumptions must be clearly stated and proposals compared to alternatives with the potential to achieve similar outcomes with less distortion to network reliability, supply chains, competition and innovation.

Proposals must be rigorously assessed at a sufficiently detailed level to ensure an efficient solution. The interaction with existing policies needs to be considered, including an outcomes or performance-based approach that allows fuels to compete without unnecessarily constraining consumer choice in new buildings.

The scope and interaction of overlapping technical issues, for homeowners and industry and must also be evaluated at a sufficiently.

Complimentary policies

The Federal Government recently consulted on the development of a National Energy Performance Strategy (NEPS), to replace the National Energy Performance Plan (NEPP).

It is expected that the NEPS will contain a broad range of measures related to home and business electrification to support greater uptake of renewables.

The NEPS is also likely to contain a range of complimentary policies that focus on creating market conditions conducive to greater voluntary uptake of electrification and schemes targeted at replacement of the lowest efficiency appliances – at the owner's discretion.

The National Construction Code is considering among other alternatives full electrification of commercial buildings for NCC 2025, which if coincident would compete for similar resources, exacerbating the issues outlined above.

It is therefore important that all arms of Government work together on any such proposals in a coordinated way and developed with industry to ensure the proposals are realistic, proportionate and deliverable and timed to ensure the least industry disruption possible.

The optimal timing of any transition must ensure it does not undermine housing supply and affordability, particularly given recent National Cabinet Commitments to build 1.2 million homes over the next five years.



1.2 Recommendations

HIA puts forward the following practical and meaningful reforms relevant to this enquiry and key strategies that Governments should consider if wide scale change to electrification is to occur. These recommendations are further elaborated on in this submission.

1. *Governments should ensure the transition from emissions intensive energy sources to renewable energy sources is appropriately managed to limit negative impacts.*
2. *Future policies should not seek to provide an advantage to one technology/energy source over another.*
3. *Future policies should continue to allow homeowners to choose the appliances they wish to install from a range of sources/products under an outcomes-based approach.*
4. *Policies should focus on creating market conditions conducive to voluntary electrification.*
5. *Energy transition must be done at a national level and industry must be a key player in designing the policy and how it could be practically applied and be developed in a holistic manner.*
6. *Complimentary policies should, through incentives and replacement schemes, focus on those without capacity to finance decarbonisation.*
7. *Timing for any mandating of home electrification policies must have regard for availability of assessment tools and skills, and supply chain capacity to be developed and have a staged implementation.*
8. *Any change to new buildings should be delivered with regard for the best practice methods of assessment of changes through the National Construction Code.*
9. *Governments should take the lead on encouraging electrification through procurement on government projects in the first instance.*
10. *Governments should offer incentives and rebates to facilitate and fast track the uptake of more energy efficient appliances.*
11. *Governments need to take into consideration the broad range of stakeholder views and undertake regulatory and market analysis of potential impacts if one fuel source is to be supported over another.*
12. *Governments support the residential building industry to remove any unnecessary barriers for further uptake of new and innovative products and materials in the delivery of new energy reforms.*
13. *There are presently a range of overlapping technical issues with renewable energy that must be resolved if wide scale change to electrification is to occur.*
14. *Any policy assessment must recognise the current level of uptake of greater household electrification, the role and cost of storage, (for both distributed and network), complexity, cost and behavioural barriers to achieving the full electrification.*



2. Responses

2.1 The economic opportunities of household electrification, including but not limited to:

2.1.1 Long-term reduction of energy price inflation

Government ensure the transition from emissions intensive energy sources to renewable energy sources is appropriately managed to limit negative impacts.

Governments take into consideration the broad range of stakeholder views and undertake regulatory analysis of potential impacts if one fuel source is to be supported over another.

Energy have increased and comprise a higher share of household budgets. They are unlikely to be alleviated where:

- A reduction in competition from disincentives for hydrogen, biofuels.
- Pecuniary externalities negatively affect customers remaining on traditional fuels e.g. gas.
- Increased capital costs and increased fixed costs for distribution networks offset or outpace savings in the energy component.

Higher net costs could still arise from electrification from restrictions in the choice of building products and services. HIA is concerned achieving electrification through prohibition of alternatives would restrict some product suppliers from participating in the market and result in less local manufacturing and more imported products.

It would also lead to large changes in purchasing behaviour for natural gas inevitably leaving a smaller pool of users to repay the gas network's fixed costs. This has the potential negative externalities as expanded below.

Where policies are successful in lowering energy prices, this ultimately reduces the justification for intervention, encourages higher energy use. Analysis should consider this and a range of predictable market responses including how higher interest rates effect household's ability to repay capital costs to achieve electrification.

It is reasonable to give all suppliers, including local manufacturers, sufficient time to prepare to meet future market needs.

2.1.2 Long term employment opportunities:

Energy transition must be done at a national level and industry must be a key player in designing the policy and how it could be practically applied and be developed in a holistic manner.

Governments support the residential building industry to remove any unnecessary barriers for further uptake of new and innovative products and materials in the delivery of new energy reforms.

HIA notes significant work being undertaken on technologies such as hydrogen, biofuels, low emission natural and LPG gasses and onsite storage systems.

Australian manufactures (both SME's and larger Australian manufacturers) require support and incentives for the supply of products to meet these new reforms. In HIA's engagement with our National Manufacturers



Council and major Australian manufacturers, we are aware that many are working on the expectation of future regulations in this space.

National support for skills and training would need to exceed that announced following the Victorian Gas ban and be commensurate with any state's gas workforce currently required to support its use. Victoria has approximately 20,000 existing licensed gas fitters that would be affected by phasing out of gas and a multiplier of reliant suppliers.

Electrification over the long term is likely to require training of plumbers electricians and apprentices to design and install heat pumps and solar hot water systems and install rooftop solar and home battery or electric vehicle charging systems. Increased capacity accommodated via existing arrangements is likely to be most efficient through a combination of additional license endorsements and units of competency to meet additional demand.

The cost of skilled labour for work on homes will be influenced by the demand for workers elsewhere in the economy.

Skilled workers will gravitate to sectors where the greatest returns are available, and the household sector will be competing with other sectors/industries to attract these workers.

In the past, when there has been strong demand for workers with construction skills from other segments of the construction industry (or from other industries) it has become far more difficult to find workers in the residential sector.

There may also be additional demand for skilled workers to maintain/replace appliances if the service life of newly installed electrical appliances differ from those they replace.

The need for alternative forms of work and re-training have both clear economic and intangible interpersonal costs. Both demand full exploration against clear alternatives and appropriate timeframes.

2.2 The macro-barriers to increasing the uptake of home electrification

The scope and interaction of overlapping technical issues, for homeowners and industry must be evaluated at a sufficiently granular level and resolved prior to announcing any commitments electrification of homes and businesses.

Industry is constantly adjusting to initiatives intended to improve the energy and environmental performance of buildings. Electrification in and of itself is not an objective, rather an option which should be considered among alternatives to achieve decarbonisation objectives.

There is concern with the narrowness of objectives overlooks other alternatives and invites behavioural responses which are either not efficient or impractical such as a reliance on onsite DER in homes and apartments.

HIA are supportive of an outcomes-based legislative approaches the reasons which are well established in its submissions, competition reviews, Productivity Commission reports.

Some states and local councils have announced bans on fuel including solid fuel and natural gas in new developments. These interactions reduce options available under the national changes, place pressure on supply chains, discourage innovation, complicate application of the standards and the removal of fuel sources concentrate risks associated with predictable disruptions.



National building energy efficiency standards have recently been updated in the National Construction Code (NCC) from 2022. Under the changes, residential Class 1 houses and Class 2 apartments require more efficient building fabric and more efficient appliances or usage be offset energy produced onsite.

Application of competing new building standards by or within states undermines national consistency efforts, the effectiveness of education and deny manufacturers and consumers access to markets and efficiencies.

Home electrification is taken to mean a policy to design a new dwelling or converting an existing dwelling from reliance on solid fuel or fossil fuel to fully electric regulated fixed appliances powered either from the grid or Distributed Energy Resources (DER). Electrification policies are therefore expected to be aimed at or result in:

- higher volume of solar panels and PV inverters on homes;
- installation of onsite generation (battery storage systems);
- electrical vehicle charging for homes and apartments;
- differing and more efficient hot water systems (electric storage, solar electric or heat pump hot water systems) and heating/cooling systems.

Australian manufactures are currently underrepresented in the supply of DER. The housing industry more broadly is sensitive to supply chain constraints and changes which increase demand for both labour and materials. Heat pump hot water unit supply is predominantly sourced from Europe and China, is one example of a supply chain currently under pressure from demand in the US.

2.2.1 Reliance on photovoltaics

The interaction of Australian buildings with the grid is becoming an increasing complex consideration. In the current market, building fabric stringency increases up-to and beyond the current 7 star minimum come at a net cost.

Benefits of electrification and household photovoltaics (PV) for households are increasingly marginal, and can lead to a mismatch in usage and generation with costs for networks and society and no prospect of payback for owners.

The benefits of electrification in households are assumed to arise from lower energy use for heating cooling and hot water supply and or being powered from a lower emission source reducing emissions. According to Australian Energy Statistics gas production in Australia is 5,730PJ, total energy use by residential sector is 483.5 PJ and gas 166PJ. In terms of emissions, natural gas emissions are currently lower than those of electricity in many states and are likely remain so for the remainder of the decade.

Higher relative emissions intensity of electricity sources for the near term means household PV is required to lower emissions and offset higher capital costs. However, this brings a range of technical challenges, interactions and costs for households.

New buildings

Sufficiently granular analysis suggested net savings in energy and emissions are not consistently sufficient in new buildings to offset the costs of adjustment in the absence of PV.¹

¹ For households, and for apartments or societally. For example the difference in assumptions between simplified policy level analysis compared to a range of representative archetypes under current appliance selection on outcomes, see the Consultation Regulation Impact Statement (CRIS) explained, ABCB 2021



Costs are strongly influenced by several baseline assumptions, which make electrification both with and without PV unsuited to mandates.

Australia currently has achieved world leading (voluntary) levels of PV penetration in over 30 per cent of all households. This uptake has been encouraged by supportive market settings, government incentives and reductions in the costs of the technology.

Under voluntary adoption, the amount of PV installed is expected to match the building's characteristics and use patterns. PV has in all likelihood also encouraged a voluntary shift to electrification at the point of appliance replacement for fixed regulated appliances, in both new and existing buildings.

Self-selection of appliances (including PV) is more likely to result in 'right sizing', to building characteristics and occupant preferences. The Victorian Net Zero Pilot recently reported that 85 per cent of the buildings built under the scheme were fully electric.

It also allows occupants to choose how losses in other dimensions such as intensity of cooking fuel source, restriction on time of use and time preferences of money are considered.

Existing buildings

While new building benefits are expected to be marginal and interact with national standards, the existing building stock presents a larger opportunity. Existing buildings currently include a range of legacy appliances and further electrification has an opportunity to contribute to a zero-carbon economy but requires significant social licence to achieve by mandate.

Households have made a range of choices to cater to individual circumstances and change is likely to be either inferior in some dimension or more costly to maintain their preferences.

On cost, large highly efficient appliances can be marginally less efficient if they replace several smaller and deployable appliances, unless augmented with individual zoning and other controls. As costs are marginal and long run, full electrification often relies on PV, which brings with it a number of technical and quality issues:

- A roof's ability to accommodate PV.
- Orientation of the buildings on site to achieve return on investment which can be difficult unless supported by subdivision design.
- Over shadowing by an existing building or new buildings, trees or topography.
- Ongoing costs of maintenance and servicing.
- Local, regional and State grid capacity both peak and minimum demand or curtailment.
- Increased insurance premiums/costs and damage costs in high wind or hail events.

Policy design needs to consider these interactions to avoid poor resource allocation and unintended consequences seen in government programs.

https://consultation.abcb.gov.au/engagement/consultation-ris-proposed-ncc-2022-residential/supporting_documents/The%20Consultation%20Regulation%20Impact%20Statement%20Explained.pdf and ACIL ALLEN Report to Australian Building Codes Board DRIS, proposal to increase residential building energy efficiency requirements Appendix D, August 2022
https://ncc.abcb.gov.au/sites/default/files/resources/2022/Energy%20Efficiency%202022%20Decision%20RIS_appendices_Publication%20version%20%28359158.2%29.pdf



2.2.1.1 Quality issues of DER

Buildings with Distributed Energy Resources (DER) are increasingly exposed to different risks which other building design preferences are required to compensate and adjust to.

There is currently an absence of regulatory standards that have led to a range of safety and quality issues which need to be addressed for DER to ensure an orderly and reliable transition. Issues include:

- a lack of consistent installation standards;
- fire risks from solar inverters, batteries and electric vehicles;
- quality of panels including service life and cracking panels;
- life cycle including manufacture and disposal issues;
- poor installation leading to panels becoming wind driven debris in high wind events;
- water ingress issues due to roof penetrations not adequately flashed;
- appropriate design and loading of roof trusses; and
- quality such as resistance to hailstorms.

Lifecycle considerations are relevant where further uptake of PV is either the aim or the result of greater electrification. Some jurisdictions have indicated an intention to measure embodied emissions, and there is limited availability of DER manufactured from low emissions intensity sources.

Disposal issues are also an emerging concern and the costs associated with any program emerging from government or the Product Stewardship Centre of Excellence funded to undertake co-design process for PV disposal should also be considered.

2.2.2 Challenges in apartment buildings

Challenges due to inadequate roof space, unfavourable geometry and higher costs associated with wiring, sub-metering constrain PV use in Class 2 apartment buildings.

Furthermore, some appliance alternatives like heat-pumps are less suited due to the climbing risks posed by the location of compressors on balconies. In new buildings, a move to shared (centralised) hot water supply as an alternative to distributed gas appliances, could require fundamentally different construction approaches, not suited to retrofitting in existing buildings, and be more costly to administer.

They are also yet to be fully recognised under the most common assessment pathway for compliance with the NCC energy efficiency requirements.

2.2.3 Grid capacity

The reliability of the existing gas network that has the proven capacity to meet winter demand for energy (and store it during off-peak season) should not be entirely discarded.

Additional network investment is bought forward by; more electrification where consumption is moved to a time of higher peak demand; or where buildings are in an area of the network which is currently constrained. Changes to demand arising from updates to energy efficiency standards for a 10-year horizon of new



buildings alone (at a 2 per cent annual contribution to stock) were assessed to result in a marginal \$1.9 billion PV increase in wholesale prices in aggregate².

The existing electricity grid is undergoing a once in a generation redesign to accommodate more wind and large scale solar, battery storage, two-way distribution and firming capacity, carbon capture and storage, and alternative fuels such as hydrogen and biogas technology infrastructure.

The Australian Energy Market Commission (AEMC) has also recently proposed to charge consumers feeding electricity back into the grid from onsite sources. Mandating significant demand via electrical appliances or supply via rooftop PV at this stage requires careful management and could distort the fundamentals which supported high levels of voluntary uptake.

Generator capacity

A move to more electric homes will inevitably result in more electricity use in winter, due to the presence of heat-pumps (even in the absence of fuel source bans) and add to a mismatch in energy generation and demand from an increasing share of variable renewable energy.

Changes in winter peak demand from fuel substitution will be challenging in heating dominant climates. Minimum demand issues are exacerbated by PV and add risks to the security and reliability of the energy system.

Decreasing minimum demand requires enhanced ability to balance loads and manage voltage, and remote disconnection of distributed solar or could result in severe disturbances on the system and impair the ability to restart the system after a major blackout.

2.3 The total upfront cost and longer-term benefits of household electrification and alternative models for funding and implementation

Any policy assessment must recognise the current voluntary uptake of greater household electrification, the role and cost of storage, both DER and networks, complexity, cost and behavioural changes required to achieve full integration.

That homeowner be able to continue to choose the appliances they wish to install from a range of sources/products under an outcomes-based approach.

There is concern about the impact of increased capital costs from a reduction in choice. There has been a substantial increases in upfront capital costs for new buildings despite flexibility in whole of home appliance selection. Forecast wholesale electricity costs increases have occurred despite the decade long investment in renewables and added and focus on energy productivity.

Further intervention in natural gas networks could mean these become unviable well before their required contribution to stability of energy networks ends. As uncertainty grows with time, benefits are therefore not assured over the longer term.

² ACIL ALLEN Report to Australian Building Codes Board DRIS, proposal to increase residential building energy efficiency requirements, 7.5.3 pg. 227, August 2022.



Additional costs of appliance replacement

The costs for existing buildings switching from gas to electricity could be excessive unless greater consumer incentives are provided.

Changing one appliance for another may be difficult and costly where like-for-like (e.g., installing reverse cycle air conditioning systems for a gas wall heater) is not achievable.

However, a gas ducted system, depending on the size of the dwelling and number of rooms, may require three or more reverse cycle air conditioning systems to cover the same area. Floors, ceiling, and roof repair removal of the existing ducted system and disposal are also required.

Electric heat pumps have typically been more expensive than reverse cycle air conditioners for other gas supported heating systems like in-floor heating and hydronic heating.

Similar issues apply to the replacement of gas stoves and cook tops depending on the age of the dwelling and the type of appliance. Tiling, bench tops and clearances to accommodate energy efficient induction hot plates and stoves, electrical supply upgrades, meter boxes and additional plug load appliances could in some cases outweigh primary cost of appliance replacement.

Mandates risk either locking in inferior financial choices or reducing an individual's ability to make a superior choice with updated information.

HIA has recently written to Government requesting that new home construction be eligible for the consumer rebates offered under existing voluntary schemes.

Assessing long term benefits

Policies assumptions despite being individually robust, may change or combine unfavourably and make households worse off in net terms. Full electrification assumes replacement of a higher emissions intensity fuel with a lower emission intensity fuel.

However, some parts of the electrification energy supply chain are higher polluters than gas networks. In reality the weight of this combined with significant increases in construction costs, labour scarcity and interest rates have real and present influence on long term benefits, as emissions reductions and bill savings can take decades to accumulate.

The effect of transfers in the economy need to be separated when assessing the costs and benefits. Retail costs of energy overstate the value savings, as they include fixed costs transferred to other energy users. Policies that reduce energy costs for some households, do not necessarily result in costs being avoided, but a proportion being transferred to other energy users – pecuniary externalities are imposed on the rest of society.

Large changes in purchasing behaviour for natural gas from bans or electrification incentives inevitably mean a smaller pool of users remain to repay the gas network's fixed costs. Grattan among others have highlighted the challenges which increase costs for those who remain and can ultimately undermine the viability of a natural gas network.³

³ Getting off gas Why, how, and who should pay? Grattan institute Pg.43.



Highly uncertain network augmentation costs are implied or incorrectly assumed to be avoided from energy efficiency measures, leading to savings being over-stated.

Energy market infrastructure costs are not linear for generation and distribution infrastructure for several reasons, savings need to be sufficient, and maintained to avoid the next increment energy of investment. Similarly, a higher capacity network is unlikely to be reduced where there is increased net demand.

Analysis must therefore be comprehensive and robust and test a range of scenarios.

2.4 The marginal cost of abatement for household electrification

Policies should focus on creating market conditions conducive to voluntary electrification.

Complimentary policies should through incentives and replacement schemes focus on those without capacity or choice in appliances.

The true costs of meeting higher energy efficiency are often substantially under-estimated in Government Regulatory Assessments.

Several public and policy exercises that claim electrification can benefit all households omit important variables or fail to account for the diversity of housing, second order effects such as transfers or simplifications around appliance preference and choice or presence of DER.

The reality is substitution of fuels can result in a variety of outcomes ranging between 'good', 'marginal' and 'poor' financial choices depending on starting conditions⁴. Electrification must be supported and timed in a way that does not unduly add to, materials, labour, delay, approval, financing or reduce occupant amenity at a time of increased housing need.

The cost of carbon emissions is also subject to contested methodologies, scopes and discount rates resulting in a wide range of values which lack of transparency in assumptions.

This leads to difficulties comparing costs of abatement between studies. Conceptually this can be overcome under a consistent framework, but few sufficiently detailed attempts are known to have been made and can be influenced by the target of the proposal.

Capital upgrade costs are driven by supply chains, availability of skills, labour and competition and limited by household budgets and borrowing eligibility. Other omitted considerations have included a reduction in property rights, choice or amenity which are not adequately valued.

The government's own analysis for the trajectory for low energy buildings supports existing buildings present magnitudes of higher abatement potential, the vast majority built prior to the establishment of minimum standards and incentives schemes a favourable lower marginal cost.

2.5 Alternative sectors and options to decarbonise the economy

Support a simple national mandatory disclosure scheme of minimum energy and/or water efficiency measures that could be completed prior to the sale or lease of existing homes.

⁴ See 4.1.1 Household energy choice in the ACT, 2020 ACIL ALLEN, which suggests several factors influence outcomes https://www.environment.act.gov.au/data/assets/pdf_file/0011/1784315/Household-energy-choices-in-the-ACT-Modelling-and-analysis.pdf



The introduction of mandatory disclosure used to quantify the energy and water efficiency of existing housing stock would assist the industry and regulators in developing policies and rebates to improve environmental efficiency of these dwellings.

HIA support a simple national mandatory disclosure scheme of minimum energy and/or water efficiency measures that could be completed prior to the sale or lease of existing homes. Any scheme should provide for the recording of relevant data concerning the energy efficiency of existing homes in a central national repository.

2.5.1 Holistic abatement

HIA maintain that improved thermal performance of existing buildings has a more critical role to play in reducing energy use.

A reduction in demand of all fuels is achieved via well sealed and insulated homes would significantly improve occupant comfort and reduce energy use, emissions and demand for new and alternate energy infrastructure networks. This could be done via a combination of targeted incentives, information and education, and concessions.

Addressing information asymmetry

HIA supports the introduction of a simple checklist approach to mandatory disclosure at the sale of any property to assist with providing the energy and water efficiency of the home. This would, assist the industry and regulators in developing policies and rebates to improve environmental efficiency of underperforming housing stock.

Tools are rapidly developing in capability building off those being developed by CSIRO, to allow the building performance to be understood at the time of purchase and capitalised into prices. Market solutions and lending rate concessions play a role in any transition.

For lower performing buildings, lower cost and higher impact building fabric performance improvements are available that will lead to passive improvements in occupant comfort, emission reduction and energy saving. These could be embedded in an industry code of practice targeting high impact interventions to compliment signals from disclosure tools.

Ideally these strategies could be incorporated when owners are considering undertaking alterations or additions to an existing home. Voluntary or incentivised with lending concessions avoids discouraging or displacing investment or other improvements related to structural, safety health or amenity.

2.5.2 Targeting lower efficiency appliances

Heated water and space heating has seen appliance's improvements in coefficient of performance (COP). There are practical limitations and technical disadvantages (noise, space, safety placement, climate compatibility and availability) mean one type does not suit all possible circumstances.

Schemes have proven highly effective in ACT and NSW that target existing buildings and appliances with lower COP. Notwithstanding the need to ensure flexibility and choice in equipment, targeted replacement with heat pumps in existing buildings has the potential to achieve comparable CO₂-e abatement with around only half the dwellings subject to NCC changes in 2022 and at a lower capital cost.



Any scheme needs to be carefully designed to account for misconduct that were reported to the NSW IPART in its report of (March 2023) including ensuring those installed are fit for purpose, the correct number and size, eligibility, removal and recycling of decommissioned units and the same service level is achieved.

2.5.3 Existing buildings the missing link

Existing buildings are recognised as a key to decarbonisation accounting for the majority of Australia's 10 million dwelling stock. Recent analysis in the Government's Trajectory for Low Energy Homes report, concluded:

- *'Existing homes represent the largest potential for energy savings in the residential building sector.'*
- *'The vast majority of Australia's housing was built before the introduction of minimum energy efficiency regulations (estimated at 8-10 million homes) for residential buildings in 2005. This means existing (pre-2005) housing will continue to pose large energy costs, health and emission issues for households, regardless of standard increases in the NCC.'*
- *Based on the modelling.... By improving the performance of existing buildings by a relatively small amount, the energy savings and benefits roughly double.*

For example, by improving existing housing stock by just 1 per cent could deliver an additional \$1.5 billion in net present value.'

To put this in context in respect to the upcoming NCC 2022 energy efficiency changes for increased stringency impose a net cost for the Australian economy of \$547 million (ACIL ALLEN 2022).

Low-cost interventions generally target fabric efficiency, but in conjunction with effective disclosure, appliance labelling standards, and targeted incentives for appliance upgrades similar to successful schemes in the ACT and NSW, would be highly effective at influencing purchasing decisions.

This type of program would provide wide ranging economic benefits on multiple fronts from increased activity, increased jobs, increased use of Australian building materials and ultimately result in significant bill savings for homeowners and go a long way to reducing Australians emissions.

The industry is willing, capable and committed to investing time and resources to help design the scheme but it needs the full backing of Governments and requires the type and resources dedicated to past approaches to new buildings stringency settings.

The program would need to go in with a mentality of looking at this from a first principles approach and treat existing buildings in a more flexible and tailored approach rather than just trying adapt the rules for new buildings.



2.6 The optimal timeline for household electrification accounting for the likely timing of decarbonising electricity

Timing must have regard for assessment tools and skills availability, and supply chain capacity to be developed.

2.6.1 Market conditions

The residential building industry, and homeowners, are presently facing a broad range of adverse market conditions, most of which are outside of their control.

Since COVID-19 challenges including a continued weakening market operating environment, increased construction costs for both materials and labour, supply chain challenges, increased interest rates, labour shortages have added to pressure on businesses.

These issues are considered important context for any future energy reform and policy settings need to be recognise that households are price sensitive to capital costs when building or replacing assets and households face higher strain on family budgets which are expected to continue over the next 2-3 years.

Further, application of new energy efficiency building standards by states has not been uniform and has undermined the effectiveness of education. Delays in the availability of energy rating tools to assess compliance coupled with ambitious adoption schedules have seriously impaired industry preparedness for NCC 2022.

2.7 The impacts of household electrification on reducing household energy spending and energy inflation as a component of the consumer price index

Any change to new buildings should be delivered with regard for the methods of assessment of impact on changes to the NCC.

HIA submit that costs and benefits should be assessed under a consistent set of policies by all levels of government and underpinned by appropriate evidence that verifies how the policy action will directly achieve the intended outcomes and substantiate the net benefit to the homeowner.

Assessment of policies are temporal, cause transfers as discussed above, should therefore ensure benefits are achieved ideally at both a societal and individual household level.

2.8 Solutions to the economic barriers to electrification for low-income households

Government take the lead on encouraging electrification through procurement on government projects and social housing.

Offering incentives, rebates to facilitate and fast track the uptake of more energy efficient practices be linked to mandatory disclosure and supported by concessional loans or rent assistance.



2.9 The effectiveness of existing Australian federal, state and local government initiatives to promote and provide market incentives for household electrification

Proposals should not seek to provide an advantage to one technology/energy source over another.

In a national energy market, states must be discouraged from acting unilaterally on fuel bans, and mandatory electrification. In new developments it complicates the application of national changes and has unknown consequences on supply chains and local manufacturing.

Local governments are even less well equipped to assess the national implications of such policies on the energy mix that will in future be required to meet consumer energy demand.

The NCC's *whole of home energy use budget* applies to new residential dwellings is an example of an outcomes-based mechanism effective in encouraging electrification. Compliance is measured based on a metric targeting a given improvement in performance to encourage the use of highly efficient regulated services such as heating, and hot water storage traditionally powered by gas or solid fuels.

The metric that underpins the *whole of home energy use budget* weighs the energy and environmental cost of the energy by fuel source. Therefore, targets are achieved using the energy use budget allowing for alternatives, using efficient appliances, or an equivalent proportion of onsite renewable energy.

However, building fabric performance is the ultimate determinant of the extent that either are required.

Policies which are fuel neutral and performance-based focus on outcomes are less distortionary to competition, local manufacturing or innovation in the sector. Innovation will be essential for of existing buildings which contribute the vast majority of CO₂-e emissions in the residential sector.