**‘NatHERS Technical Overview’   
Webinar and Q&A transcript – recorded 22 November 2021**

**Andrew Law**  
Hello and welcome to the overview of the NatHERS technical updates. I am Doctor Andrew Law and I'm here today with my colleague Jodie Pipkorn to take you through these changes. I'll be focusing on the updates to thermal assessments and the expansion of NatHERS into the Whole-of-home space, and then Jodie will take over and talk about the extension into existing buildings with In-home assessments. Before I begin today, I would like to acknowledge the traditional owners and custodians of the land on which we're all meeting and attending today. I'm here recording and attending from Canberra, which is Ngunnawal country. I would like to pay my respects to elders past, present and emerging and extend that respect to any First Nations people attending today.

I'm going to be talking about how NatHERS is expanding to accomplish the technical goals of the scheme that includes updates to the thermal performance ratings and introduction to the Whole of Home performance ratings and also an overview of the in-home performance ratings. For almost 30 years NatHERS has provided energy performance information and thermal performance ratings to support the delivery of comfortable energy efficient homes to Australian homeowners. NatHERS is now being updated to support a number of initiatives in the Trajectory for Low Energy Buildings and the proposed changes to the minimum standards in the National Construction Code or NCC 2022.

Updates to the NatHERS thermal assessments will reflect whether a home meets or exceeds the seven star NatHERS thermal performance rating, the enhancements to the NatHERS climate files and star bands, the split heating and cooling load limits and thermal bridging.

These will be covered in more detail in the coming slides. NatHERS is also expanding to include the Whole of Home performance ratings and tools, which include all of the major energy uses in the home and in-home energy assessments, which will allow houses to be assessed where house plans do not exist using an in-home assessment process. We will now be covering updates to the existing thermal assessments.

We'll now cover the NatHERS climate zones updates based on more recent weather data. These updated climate files and recalibrated star bands will have no impact on how you do your assessments, but results may shift based on your climate zones. You may observe different approaches being rewarded more or less than previous iterations of the NatHERS tools, as we now have a more accurate representation of the local climates than before.

Heating and cooling load limits are also being updated to align with the proposed move to the seven stars.

These updated load limits are being adjusted to reflect the changes to the NatHERS climate files and the associated changes to the star bands. The split loads will be updated using the same principles as before, whereby they aimed to exclude the worst 5% of heating and cooling loads, based on the historical data that's recorded in the Australian Housing Data Portal. Re-star banding has caused the star ratings to stay the same, however the heating and cooling loads have experienced some change. The software and certificates will help users by disclosing the applicable NCC limits with N/A, if they don't apply, for example in New South Wales. The ABCB has also proposed changes to the thermal bridging requirements for residential buildings, as thermal bridging can significantly reduce the effectiveness of insulation if not accounted for. The objective is to improve the accuracy of predicting the thermal resistance of the building envelope and the proposed provisions prescribed that metal-framed construction should match the thermal performance of timber frame construction on energy rating calculations. This impacts the difference between timber and steel.

For example, if a timber frame would reduce the average R value by 0.2 across the wall, and steel framed would reduce the R value by 0.3, we only account for the 0.1 difference between the two.

The new NatHERS technical note will clarify which building elements need to consider thermal bridging and will also define the default values for things like stud spacing or metal thickness, should these not be known at the time the NatHERS assessment is being performed.

We will now be introducing the Whole of Home assessments. The NCC is proposing that there will now be 2 performance requirements to meet the deemed-to-satisfy compliance. These are the thermal performance ratings, which are being updated to align with the proposed shift from 6 to 7 stars and the Whole of Home performance rating, which is similar to the thermal performance ratings where a single number on the Whole of Home scale will represent the deem-to-satisfy provisions for demonstrating compliance with the NCC Whole of Home energy use budget.

It will deliver industry a streamlined and cost effective approach to demonstrate compliance with the proposed NCC requirements. Whole of Home assessments will leverage and expand on the key elements of the current scheme and build upon the thermal performance ratings.

So to meet the new Whole of Home energy use budget proposed for 2022, different appliance efficiencies and or on-site energy generation and storage can be combined to get the best outcome for individual circumstances.

But let's go into this in a bit more detail.

The whole time expansion is just that, with the ratings now including all of the major energy uses in the home. So this includes heating and cooling appliances, water heating pool and spa equipment, lighting, and on-site energy generation and storage, with some allowances being made for plug loads and cooking equipment.

These new assessments will impact the current process with changes and updates to account for the inclusion of these appliances, a new energy rating and training and accreditation.

With these changes, we are ensuring that the process remains uncomplicated and easy to engage with. The energy load of each appliance will be calculated in a way that balances the need for accuracy but still keeps the process as simple as possible for assessors.

After the energy requirements are calculated, we show you how to compare the impact of appliances with different fuels.

And how this is all brought together in a way that allows for the comparison of different homes, but also provides flexible and simple ways of demonstrating compliance with the NCC.

The Whole of Home assessment makes use of a lot of information already entered for the thermal assessment, such as the location or the climate information and the floor area.

Assessors can then enter the relevant energy efficiency measures, such as the star rating or energy efficiency ratio, coefficients of performance (COP) or the small scale technology certificates that set the energy efficiency of each appliance.

Where these details are not known, the tool enables a series of default values for some appliances, or otherwise refer to the technical note and handbooks to get guidance on these default settings. Based on the appliance types selected, the Whole of Home tools will then calculate how much gas wood, and electricity is required for each hour across the whole house.

So for example, if you chose a gas hot water system, the tool calculates how much gas you need in each hour for that specific home in that particular location, or if you decide to go with a heat pump, then the tool figures out how much electricity is needed instead.

The tool also calculates any solar PV generation and battery storage, with electricity being separated into the imports from the grid or exports. The Whole of Home energy calculation also takes into account the different values of energy across the country. Prices are very different in Queensland compared to Tasmania for example, and this is actually reflected in the values that are applied by NatHERS.

This means that just like the thermal star bands having different energy loads in different locations, the Whole of Home ratings will have different societal costs for different locations.

This allows for the NatHERS tools to respond to the specific environmental conditions as well as the particular energy economics of the region.

As distinct from the Thermal performance assessment, the Whole of Home assessment is not just about how much energy is used, it's also about when that energy is used, either during the day or even across the year. This is important as it reflects the impact of peak load on the grid.

Peak times are at a higher cost than shoulder and off peak times, reflecting the overall impacts of energy use during these periods of the day, and this is the key reason for the hourly energy calculations.

The reduction of 1 kWh during peak time has a greater impact than reducing one kWh of electricity used during an off peak time. So solar and battery storage can also help with these peak loads. Energy can be drawn from any on-site generation in times of peak loads during hot days or evenings, which helps reduce that load on the grid. Once all of the appliance information is entered, the tool will calculate the overall energy, use the cost and the greenhouse gas emissions, as well as an overall Whole of Home performance rating.

This and other information will be included on an updated NatHERS certificate. The Whole of Home rating is based on the NCC’s societal cost metric. For anyone who is unfamiliar with the societal cost metric, it's a metric that reflects the impact of the fuel being used to run the appliance, based on the cost to consumers, the broad impact on the energy networks and its environmental impact, which in this case is represented by carbon emissions.

This attempts to account for all of the ways in which the energy you use at home impacts both yourself and the wider community and the environment.

To bring together in a single value, each of these is represented by a dollar figure that can then be applied to the energy use. Now, once we know the total cost or credit for the house in each hour of the year, we can add this up.

And then, once we've added all that up, we convert it into a rating. The higher the societal cost, the worse the overall impact, and so higher societal costs will result in lower ratings, and vice versa. This is the same way that a ten star home with a very low energy requirement, is much better than a one star home with a very high energy of requirements.

It's proposed for NatHERS that this societal cost value will be converted into a single number on the Whole of Home scale to represent the deemed-to-satisfy or DTS provisions, for demonstrating compliance with the NCC’s Whole of Home energy use budget. New information about the predicted energy use cost and greenhouse gas emissions will help consumers to understand what appliances have the biggest impact on their home’s annual energy use, cost and greenhouse gas emissions.

Appliance choice can be an easy way to improve the homes energy rating and to make it more comfortable to live in, as well as help saving on energy bills. New information will also be available about how much of the home’s annual electricity use will be met by renewable energy.

The certificate includes the percentage of electricity used by the home and the percentage that's exported to the grid. You can also see how the home performs with and without solar and what the associated greenhouse gas emissions and savings are under those scenarios.

There are a few endorsed tools available now, including AccuRate and the FirstRate5 Whole of Home pilot tool. These tools perform the hourly calculations and report on a range of the Whole of Home elements, but won't produce results for the Whole of Home ratings just yet. Now, while these and other tools that gain accreditation under the NatHERS scheme are intended for assessing compliance with the NCC, these particular consultation editions can't be used for that purpose.

Information for AccuRate users, including a short video demonstration is on the NatHERS website. And information for accessing FirstRate5 is through the Sustainability Victoria link. Please note that Sustainability Victoria won't be granting access to their tool unless you have completed their training, but they are providing those sessions for free.

To assist assessors undertaking Whole of Home assessments, the technical note and assessor handbook is being updated.

It's proposed that the Whole of Home information and guidance is to be added to the current tech note and Assessor handbook. The tech note will be updated to include the essential instructions that must then be followed when undertaking Whole of Home assessments.

The Assessor Handbook will be updated to provide broader guidance on how to undertake a Whole of Home assessment. It is hoped that including the Whole of Home assessment instructions within the existing documents will make it easier for assessors to transition from thermal performance process to the Whole of Home assessment without needing to draw on additional pieces of information.

You can provide feedback on the proposed approach as well as what is proposed to be included in those documents as part of the NatHERS consultation. Assessor training for Whole of Home is being developed in two streams.

The first stream is aimed at existing NatHERS as thermal assessors to help train them to become Whole of Home assessors. We are developing continued professional development or CPD training units that assessors can undertake through their relevant assessor accreditation organization (AAO). The first overview unit is to be released later this month, with the next units focused on each Whole of Home appliance to follow next year.

The second stream is aimed at new NatHERS Whole of Home assessors. We're currently reviewing the Cert Four In Home energy efficiency and sustainability to ensure that it covers the Whole of Homes, skills and knowledge requirements. And any changes needed will be incorporated into the course by the start of the new NCC provisions.

I'm now going to cover the extension of In Home assessments and this is going to build a lot on what Andrew has just being talking about, but what I'll cover is what is NatHERS In Home? And really, the differences between NatHERS In Home and the NatHERS Whole of Home.

So I'm going to cover off now on what NatHERS In Home is, and there's the five key points that I'll cover. So the first one is NatHERS In Home is designed for assessing existing homes as opposed to new homes.  
NatHERS In Home is an assessment in the home as opposed to using house designs and plans, and so the key difference there is you actually have an assessor walking around your house, and so there's different data that can be collected and is a different process involved.

NatHERS In Home is also building off the NatHERS Thermal and NatHERS Whole of Home, so it's really making sure that the ratings for new buildings that are currently being used and as talked about previously, the extension to the Whole of Home. What matters In Home is going to do is take all of that and apply that to existing buildings.

The fourth point, as shown on this slide, is that it will provide a rating, but it will also provide information about how you can improve the home and so, unlike new homes where you can actually completely redesign the house. For an existing home, there's only a limited amount of things that you can do. So that's where NatHERS In Home is really focusing on what can you do to improve the energy efficiency of that home. The final point is NatHERS In Home is voluntary, so unlike the NatHERS thermal and Whole of Home which are getting used for National construction code purposes and for regulation, NatHERS In Home is voluntary.

So now I'm going to cover how NatHERS In Home is being established. As I mentioned earlier, we are actually building off the Nat HERS thermal and the NatHERS Whole of Home. But we're also leveraging the National Scorecard Initiative, which is being managed by Victoria. The National Scorecard Initiative was recently endorsed by NatHERS and the purpose of that is it has been designed for existing homes and it's been trialled and piloted across the country.

So it really is fit for purpose at this point. NatHERS is leveraging that. It's going to phase it in. But there will be some changes to the National Scorecard Initiative as NatHERS In Home gets established. We are, as I mentioned, building off the thermal and Whole of Home. And as you will have heard previously, the Whole of Home rating is still being finalised and so once all of that gets finalized, NatHERS In Home will be finalised and a scorecard initiative will be adjusted as appropriate.

What the aim for NatHERS In Home is going to be, is that we will then transition to open the market up to other tools so that a range of tools can be accredited; similar to how NatHERS currently works (where different tools are designed appropriate for the different users and the way they want to use those tools).   
Finally, NatHERS In Home, as part of the Scorecard initiative, rolling out assessor training and accreditation at the moment. The intention is that those people who are getting trained and assessed and accredited at the moment will actually be transitioned into NatHERS In Home and they'll be deemed NatHERS In Home assessors once that transition happens. THeres a whole process that's happening over time and that'll be phased in.

I'm now going to cover the differences between NatHERS In Home and the NatHERS Whole of Home. So the first point is the data collection. The data collection that NatHERS thermal and Whole of Home uses is based on the house plans and specifications, whereas the data collection process for the NatHERS In Home is taken from inside the home. And so what that means is there's a visual inspection and it's really only what you can find in the home and the information there that you can actually put into the tool. So it is much more limited as to how that all works.

What that means is that we then have to make different assumptions about NatHERS In Home to what we make for the NatHERS thermal and Whole of Home. The technical assumptions need to take into account the age of the building, the different appliances, and particularly because you can only do the visual inspection, you don't know exactly what was used. So there's things like simplified zoning is incorporated; insulation, so there's assumptions about how much insulation is going to be in the walls, and a lot of that's determined by the age of the building and what the requirements were at that stage. And there's different assumptions about the windows because you can only visually look at them. You don't know, for example, is it a thermally broken aluminium window? Or is it just an aluminium window? So there's different assumptions based on the age of the building that will be assumed for NatHERS In Home.

The other component that's different is safety, so unlike the NatHERS thermal and Whole of Home which are desktop assessments, there's a lot of safety requirements that assessors need to take into account when they're going into our home, and including when they're getting up a ladder to see if they're ceiling insulation. So that's where it starts to differ from NatHERS thermal and Whole of Home. The final point is about the economical and timely assessment, so there's different things that have to be taken into account because you've got to go and collect data in the house.

What NatHERS In Home has tried to do is really balance how much information needs to be input into the tool versus how much can be assumed and trying to find a balance between the time and costs that it takes for an assessor to be in the home to do that assessment.

But the majority of the other components are all building off the NatHERS thermal and Whole of Home as much as possible, and taking into account some of the National Scorecard Initiative assumptions because they've been learning over time as to what information really does need to be gathered from the home.

So in terms of the differences between NatHERS In Home and the NatHERS Whole of Home and the thermal of certificate. Andrew talked a bit about those other components, but the key differences for NatHERS In Home, is that it will be a different certificate and the colour and layout will differ. And that's really to differentiate it being a NatHERS In Home assessment compared to a design assessment and also to make sure that householders who are the main primary audience for this certificate, actually understand the information that's included.

It'll have information about how to improve the home, and that will be slightly different to the NatHERS thermal and Whole of Home purely because they're designed. You can actually do all sorts of different changes to improve those homes, whereas because this is an existing home, there's only certain things you can do, particularly on the thermal shell, and so that improvements become a really important component of those certificates.

And the final difference between the NatHERS In Home certificate is the comfort rating and because you can't make as many changes to the thermal shell, it becomes really important that people actually understand what the thermal properties of the house is, but also how comfortable that's going to be for them. So to make it really simple will be having these simple, comfortable ratings on the house to just indicate to people in extreme cold or extreme hot what that temperature is going to be like and how comfortable that home is.

So the NatHERS In Home assessors are slightly different to the NatHERS Whole of Home and the NatHERS thermal. What we're doing for NatHERS In Home is we’re really building off all of the processes that National Scorecard Initiative is incorporated. They've been doing a lot of training processes and they rolled that out nationally and they've been doing a lot of learning by doing and through that process they've found what works and what doesn't. So we're really leveraging all of the great work that they've done.

The National Scorecard Initiative will continue the training process over the next few years and over that period of time we are looking at transitioning to the registered training organisations to conduct the training and to the assessor accrediting organizations to take on that accreditation. But that will happen over time and it'll be phased and the details of that are still being worked through. We are keen to hear from people through this consultation process, what are your thoughts on all of those different proposals and what are your suggestions or things that we need to take into account because it is very early days?

We are looking, as people are trained and accredited, that if you're training accredited now under the National Scorecard initiative, that will transition across to NatHERS In Home so that whole process will transition. There may just be some additional continuing professional development or other things that assessors need to do just to bring them up to speed with any changes that may come into play as the NatHERS In Home is finalized. In terms of the technical note, we are leveraging and building off the NatHERS thermal and NatHERS Whole of Home.

But like I've mentioned earlier, there are some differences with NatHERS In Home. So the technical note will be somewhat different when you do an In Home assessment. You have to collect data and look at the different features, so that will have to be explained. But there's also things about the evidence, requirements and photographs because it's an existing home, to be able to make sure that the quality assurance is there and doing audits after the process. We actually do require photographic evidence, and that can then make sure the checks and balances are in place because we don't have house plans which are usually used to do those audits and quality assurance for NatHERS Whole of Home and NatHERS thermal.

We are going to include in that technical note also things like simplified approaches to zoning, how insulation and those different things are factored in. So the technical note will differ slightly, but a lot of it will be somewhat consistent with the technical note that currently exists and is being developed for Whole of Home.

The final component for assessors is the Assessor handbook and we are looking at developing this in consultation with In Home assessors, but we're also looking at building off the NatHERS current assessor handbook, but also building off the National Scorecard Initiative Handbook. We're really trying to leverage as much as possible from those other processes, but make sure it's fit for purpose.

The NatHERS In Home, as an indicative assessor training timeline, we have started at the end of this year to look at the review of the skills and the certificate four. We are looking at the moment what are the skills and requirements for a NatHERS In Home assessor and what are those needs to determine, is it a certificate four or is it some units from a certificate four? So that's still being worked through at this stage. The intention as you can see in this slide around the middle of next year, possibly.

Noting that this is indicative only and that may change depending on when all the other processes are finalized. What we'll be looking at doing is offering the continuing professional development for scorecard assessors, once the scorecard tool is accredited. So that'll come into play around that point in time. The intention is towards the end of next year we will complete all of the certificate four updates or any of the changes that need to be undertaken for any of the units that are incorporated into the certificate four, so that gets finalized.

And the intention is probably from 2023, and again that transition phase is still to be determined, we will be looking at commencing the rollout of training and accreditation with the registered training organisations and with the assessor accrediting organisations. The reference on the bottom of this document on the consultation hub, you can actually find this document which is the *pathway for training and accreditation of Nat HERS In Home assessors*, and that document outlines all of what I've told you in more detail.

And we are really keen to get feedback to best understand how can this work best for the industry and assessors and for the assessor accrediting organisations and RTO. So please let us know your thoughts.

So on this slide you can see that we've got the contact details, so if you do want to contact us, please contact us through that email address – [admin@nathers.gov.au](mailto:admin@nathers.gov.au). But on this slide there's also the information about the consultation website which has got the details about the how you can submit a submission, how you can respond to the survey, and it's also got all of the different documents that you can read through more detail, including the discussion paper that covers all of the things that we've just talked about and whole lot of other things as well. We're now going to move to the question and answer session.

So please put your questions into the chat box and we'll go from there.

**Angela Newey**  
Thank you very much, Jodie and Andrew. I will now turn to the question and answer session as I mentioned. Please put any questions into the chat as you have been. So we have Jodie and Andrew here also to ask answer questions and we have Dave Rochford from the NatHERS Operations team. And also Jo Brennan from the Whole of Home team available to answer questions.

I should just point out that we are recording this session and it will be uploaded onto the web afterwards. So the first question that came through is for you, Andrew.

**Question: Is there an allowance for off grid solar systems?**

**Andrew Law**  
So the short answer is that we're still working on exactly how we deal with homes that are completely off grid and solar systems that are completely off grid. And just trying to figure out a way of making sure that we can maintain sort of some overall integrity of the scheme for these homes that have these different Off Grid network kind of design solutions available for them.

Jodie I don't know if you have an addition for the In Home assessments on that.

**Jodie Pipkorn**  
A lot of what we're doing with the In Home is really building off the Whole of Home. The scorecard initiative that's currently being used under NatHERS In Home, it's been endorsed by NatHERS In Home. We're basically using that in the interim, and the intention is that as NatHERS Whole of Home gets finalized, we'll be aligning as much as possible for NatHERS In Home with the Whole of Home and then the scorecard initiative will be adjusted to suit that. We'll have a scheme as much as possible leading from new homes to existing homes.

**Andrew Law**  
And to just expand a little bit on that part, the complicating factor for this is what do we do with homes that have got things like petrol based generators or diesel generators that are providing the home with electricity when they're not getting it from their solar system and we just haven't quite got to the point that we're looking at those calculations just at the moment.

**Angela Newey**  
Thank you Andrew and Jodie.

**Question: how often will energy dollar values be updated? Tariffs changed pretty frequently.**

**Andrew Law**  
So just to sort of separate a little bit, there will be a difference in the potential update timeframe of the societal cost metric that underpins the rating versus the additional factors for greenhouse gases and energy costs that will be underpinning our additional information. It's planned that we might aim to do the societal cost updates more in line with the NCC timeframes because that has a regulatory impact.

But the additional information, ideally we can get these because they aren't regulatory. Ideally we can get these in sort of on a 12 monthly rolling basis.

At those will sort of be a little bit subject to change and sort of seeing what the landscape looks like when it comes time to do those things though.

**Angela Newey**  
**Question: will Whole of Home replace Basix certificates in New South Wales?**

**Andrew Law**  
I think in terms of how NatHERS Whole of Home and Basix sort of interacts, it's not intended at this point that the NatHERS Whole of Home certificates are going to replace Basix. Basix will continue to be the pathway in New South Wales as far as we're all aware at this stage. You may all see at the moment Basix are doing a consultation, so I think if you want to ask any sort of really detailed questions about how NatHERS and Basix interact and which parts Basix will be picking up, and which parts are going to be aligned, it's probably worth getting involved with that process. At this point, I think we always work pretty closely with the New South Wales team to make sure that our processes and calculation methods are aligned and they've been along for the ride with us pretty much the whole way as well.

**Angela Newey**  
**Question: Because societal cost changes overtime, does that mean house scores on the scale will change over time?**

**Andrew Law**  
Potentially, yes, it depends. A lot of these things do depend on this really specific way in which the societal costs metric gets implemented as part of a rating, and exactly how these things do change over time. We will obviously every time we make a change in NatHERS that will start hitting on the regulatory frameworks and things that influence the NCC, we will be doing a whole range of work to try and assess what those impacts are going to be. It's likely that on those three year updates, we will see a little bit of change.

Exactly how big that is, I don't really know, just at the moment. But we are currently running a couple of projects that are looking in depth at what the metric to the rating calculation process will be, and part of that will be able to explore when this societal cost metric start changing. How much is that going to actually see the ratings of a particular house shift?

It’s not necessarily a bad thing if we see over time particular fuels becoming more or less carbon intensive because that is part of the societal cost metric, or fuels becoming more or less expensive. To see homes that utilize those fuels get higher or lower ratings as time goes on.

We'll do our best to kind of keep everyone up to date and talking you through those changes as they happen.

**Angela Newey**  
**Question: When I played with the draft Whole of Home calculator, it was very hard to comply. If you have a pool and a roof unsuitable for PV, is that still the case?**

**Andrew Law**  
That is a really tricky question to answer, and there's so much that goes into a Whole of Home assessment, and I think as you all probably know, being assessors, the assessments can really change depending on specifically where you are.

It maybe possible with the NatHERS tools. I'm making the assumption that this question been asked by someone who is using the ABCB’s NCC calculator, so the NatHERS tool will be a little bit more nuanced, and you can do a few more bits and pieces.

Pools will be a little bit harder because the benchmark for the energy budget calculation doesn't necessarily include a pool, so I haven't quite figured out exactly how those bits and pieces play into each other.

But I do believe that the pools will be adding a lot more energy, so it's probably going to consistently be a little bit tougher to meet the requirements, so you'll have to do a few more things in the other areas of your Whole of Home assessment to kind of offset that impact. So you might have to go a little bit harder on those high efficiency hot water systems, or it may be that this is one of the scenarios where you, in your particular scenario, in your particular location, you may just need to be someone who's putting things solar PV on.

Their ideally will be a range of options for everyone who's playing with all the tools to find your own path where that works as well as it possibly can for you and your scenario.

It's sort of the ultimate goal and the intention of our Whole of Home tool.

**Angela Newey**  
Thank you Andrew. I have one now for you, Jodie.

**Question: What role will the real estate industry play in the In Home assessments?**

**Jodie Pipkorn**  
So the real estate industry, I suppose, like I mentioned in the video, the real estate industry, like everyone else, could be using NatHERS In Home, because it is a voluntary initiative. One of the things that the real estate industry could use it for is to promote the energy efficiency of a property. But one of the other parallel policies that we've got is we are developing a national framework for the disclosure of energy efficiency information, and that is going to be underpinned by NatHERS In Home.

And it really is an opportunity that a lot of stakeholders from the real estate industry, banking industry, the building sector as a whole, could all be using NatHERS In Home to promote their products, and to promote more energy efficient properties. So it really is an opportunity for people to be using NatHERS ratings with wherever they think they would be useful.

**Angela Newey**  
Thank you, Jodie. These are great questions keep them coming up.

**Question: If tariff rates are state based, will NGA’s use state based values?**

**Andrew Law**  
So NatHERS will, as much as we can, be using the state based values, so we have the National Carbon Accounts that are reported down to the state level, and the market research that was done for the NCC also groups the tariff structures at the state based level. What this means is that because ultimately the building codes are legislated at the state level, there isn't a level playing field sort of across the state. We're not going to go too far down the rabbit hole of getting the differences between different post codes or different NatHERS climate zones inside all of the states.

Being able to do the required amount of research that'll take to get data down to that level is probably a bit beyond the scope of what NatHERS can do at this moment in time, we might be able to do that well into the future, but at the moment we will be sticking to kind of at state level.

**Angela Newey**  
Thanks Andrew. So we have a question that's been emailed into the NatHERS account.

**Question: Does NatHERS account for embodied energy?**

**Andrew Law**  
Well, I think that's another one for me. At this point in time, no is the short answer. Embodied energy is a very important part of the life cycle of a building, and its overall impact. It's also exceedingly complex, and for a scheme that has the depth and breadth of NatHERS, in order for us to be able to make a step to NatHERS Whole of Home, in addition to all of the changes we're making for thermal, we just don't have the resources at this time to also explore that really complex and really nitty gritty area that you can get into with embodied energy.

And it is on the longer list of things that we would like to be able to look at into the future. But at the moment we're only able to focus on getting our operational energy right, and also because the NCC is also only looking at the operational energy at this stage as well, we're having to start with that target point to make sure that NatHERS is fit for purpose, to be able to continue to support our assessor community doing the NCC work.

**Angela Newey**  
Sorry, I was on mute, so another question for you Andrew.

**Question: For Whole of Home assessments, it seems that a home can have inefficient appliances and just have a big enough solar system to obtain the required rating. Is that correct?**

**Andrew Law**  
Sort of. So you do still need to meet the thermal shell provisions though the thermal shell and the Whole of Home provisions, you have to meet both hurdles. So for the NCC, that will put a floor at least with the current draft, at least at seven stars and then it is up to you and the way in which the ratings and the provisions are written at the moment. It is up to the assessors to come up with what is the most cost effective or the most appropriate solution to work with your customers and your homeowners to design something that works for them and that gives you the flexibility to go well.

If I want to produce a building that has no solar PV on it. You should be able to find a pathway to at least get almost all the way there. In some cases it may not be possible, maybe in some climate zones. I honestly haven't looked, haven't had the chance to do the detail work and look through everything, or one of them, to figure out exactly how each one of the NatHERS climate zones is going to behave, and the results that you might be able to achieve.

But you know, it will be flexible enough so that you can work with your clients to be able to find out what that solution looks like for them.

That doesn't mean that if you have a builder or homeowner who really wants to just go with the lowest efficiency appliances that they can possibly afford and put on a really big solar PV system depending on what the rules look like, the final requirements of the NCC, we don't quite know exactly what those are yet, it may be possible for you to pass a building that looks like that. But it will still at least have the minimum thermal shell performance, and it will still have some of those other protections from things like MEPS and GEMS.

**Jo Brennan**  
I might jump in there, it's Jo Brennan here. We just also really welcome any feedback around those issues. If you are interested, it's something we'll be looking at into next year as well, so any views are very much welcomed on that as part of their survey and if you want to, in a submission.

**Angela Newey**  
Thanks Joe. Here we have one in-home assessments now.

**Question: Will you require a police criminal check before becoming an In Home assessor?**

**Jodie Pipkorn**  
So currently the National Scorecard Initiative does require photo ID and a working with children or vulnerable people card in certain circumstances and in developing the National Scorecard Initiative, it was found that different jurisdictions do have different requirements around certification of working with vulnerable people and so at the moment we are still developing up exactly what will be in the NatHERS In Home, but we are looking at building off the National Scorecard Initiative as much as possible.

So at this stage it's a bit of a stay tuned, but we would be requiring some sort of photo identification as a minimum, and it's really then what builds on from that.

**Angela Newey**  
Thank you, Jodie. Dave a question for you.

**Question: Why does air infiltration not feature in the new Seven Star assessment and Whole of Home Assessment? In other words, a blower door test.**

**David Rochford**  
Thanks, Angela, good question and it is something we're working towards, but It's actually quite complex and quite a few changes will need to be made. first of all a certain amount of airtightness is assumed, of infiltration for each NatHERS assessment based on the number of windows and, you know, ceiling penetrations, that sort of stuff you have in your house. So to actually nominate an air change per hour that you're aiming for, and then to be able to test and verify that, is something we're looking to incorporate. We'd also need to know what the changes in NCC 2022 which we can piggyback on, for instance there is a verification pathway there for blower door test which we could call. There are also some verification rules if you have a very tight house, about mandating mechanical ventilation, other minimum specifications and safety requirements. So those things will, you know, be hopefully in place through the NCC and some of those protections that we would need.

But we also need to change, allow thing in the Chaneth software, the ability to incorporate mechanical ventilation and things, you know, quite sophisticated things like heat recovery, ventilation.

So at the moment NatHERS is very good at tracking heat flowing through materials and through open windows and through, you know, gaps and that sort of thing, but it's not very good at tracking heat that's being mechanically moved around from one room to another, some of the heat being lost to the outside, some of it not. So those are the things that CSIRO are still working on, and something that we'd like to incorporate at some point in the future. So yeah, watch this space.

**Angela Newey**  
Thank you Dave. Another one for you Andrew.

**Question: How will pools that are put in once the home is constructed under a new building approval affect the energy efficiency rating? Will there be any need for disclosure and amendment to the NatHERS Whole of Home rating?**

**Andrew Law**  
No, I think I've got it. This sort of thing comes up quite a lot, and this is not the first time that someone has asked me about how we're going to deal with pools and what the impact that pools are going to have, and whether it's going to mean, whether the Whole of Home changes in the NNC are going to mean that we see a lot more of people getting their home built and then putting a pool in six months later.

Now unfortunately, the point at which NatHERS interacts with the NCC, with the construction cycle, at the moment, means that there's, for the Whole of Home and NatHERS Thermal as it currently exists, there's not a whole lot of scope for us to change ratings for people who alter the building after it's been built and after those buildings certificates have been sort of issued.

However, that's where we have Jodie's work with the NatHERS In Home because at that point the pool will be built and will be there and will be available for assessment, so Jodie, I think you had some additional points to make on that.

**Jodie Pipkorn**  
Yeah, the key thing I would add to that, Andrew, and you're right, is that's why a lot of what we're trying to do is make sure that the NatHERS Whole of Home and NatHERS In Home align as closely as possible so that we can actually see that transition over time.

If someone says I'll get my pool, I'll add that later, because I then don't have to meet particular requirements. It will then be picked up if in the future, where there were requirements for disclosure, or if some real estate agents are really promoting that energy efficiency information through an in-home assessment, it'll be picked up at that point.

So it's ultimately throughout the life cycle of the building you're actually getting those links between them and there is potential in the future. I suppose at the moment we're looking at NatHERS In Home for existing homes. We've got the NatHERS Thermal and Whole of Home for those new builds or major renovations. There is this point in between, which is how much of that information, and I think there was some alluded to in one of the questions about whether you get a, I suppose an as built rating, which is slightly different to the NatHERS In Home which actually does the checks and balances somewhere in between.

So it's really how do we create the links throughout the lifecycle of the building that we can actually be tracking them much more closely. And if we don't pick it up in one point, the energy efficiency will be disclosed or communicate at a point further down the track that can pick up any of those changes.

**Andrew Law**  
Yeah, I think that's it's actually worth sort of noting that any changes that someone makes to any of their appliance selections and changes the efficiency of the home, say adding external shading here or and so on, those types of things that happen naturally over the life cycle of a building, will be able to be picked up and reflected more frequently, more readily through the NatHERS In Home process because we have more touch points with that building over its life cycle then we had with our current sort of design and new build facing NatHERS scheme.

**Angela Newey**  
Thank you Andrew and Jodie.

**Question: I have done roughly 1300 scorecard assessments. Will there be recognition of experience for existing scorecard assessors when considering training requirements?**

**Jodie Pipkorn**  
In short, yes. So the process at the moment is that if you are a current Scorecard assessor, you will be deemed a NatHERS In Home assessor. Because there may be some changes needed to be made for NatHERS In Home, when it's finalised, and the National Scorecard Initiative may have to have a few adjustments made., tere will be some continuing professional development training that may be required so that you've done all your assessments and you just need to really understand those differences between NatHERS In Home so it shouldn't be too onerous at the moment.

And then for new assessors that are coming into the industry, the intent is that overtime we will end up moving that training to the registered training organisations. So new assessors will actually go through the comprehensive training for NatHERS In Home and a lot of that will leverage off the process that the National Scorecard Initiative is undertaking. But we been working with Artibus who develops the certificate four looking at a skills assessment and so having gone through that process, we're starting to work out exactly what skills are needed such that that training can be delivered to inform those processes. And like I say, the National Scorecard Initiative is already delivering a whole lot of those processes, and you know a lot of the things are already covered, so we're not expecting there to be major changes from the current processes. But there are likely to be a few.

**Angela Newey**  
Thanks Jodie. OK, another one for you, Jodie.

**Question: How can existing NatHERS assessors become scorecard assessors?**

**Jodie Pipkorn**  
So we have got links on our website to the Scorecard web pages and so if anyone would like to become a Scorecard assessor now, you can actually go through that process with the DELWP, with the Victorian Government, currently managing that process. So basically you can go through their training and once you go through their training you get accredited, you can then be a scorecard assessor.

So there are links on our website and I'd say that's the best location to go for this under NatHERS In Home, go to those links and it'll lead you from there.

**Angela Newey**  
Thank you Jodie. Another one for you.

**Question: Do you think the In Home assessments will become a mandatory requirement, disclosure for sale or rental of property, and does the assessment provide estimated costs of upgrades and return on investment?**

**Jodie Pipkorn**  
So like I mentioned earlier, we have got a national framework for energy efficiency disclosure being considered at the moment and that does discuss and talk about whether in the future it could be required at the point of sale or rent of a property. But it is very much a jurisdiction decision and there has to be further considerations of cost benefit analysis undertaken, so it's at this stage it's very early days and that's not something I suppose from a NatHERS Perspective we are primarily focused on.

We're really making sure that we do have the capabilities of having these in-home assessments for use, not just for a mandatory disclosure perspective, but also if other players want to be using that now, and we do know that, for example, some financial institutions are currently offering, you know lower interest loans based on those assessments, and it does provide information for people. If a consumer is thinking of doing a renovation or upgrade, they can actually identify what are the best things that they could be doing.

So in that sense we are seeing NatHERS as underpinning a range of initiatives and that disclosure is one, if it was required in the future, that's a decision for state and territory governments, but NatHERS will be ready by that point in time to enable those assessments to happen, if jurisdictions choose to use that to underpin their initiatives.

And like I mentioned, the disclosure framework does use the NatHERS and NatHERS In Home as that underpinning way of doing those assessments.

With regards to the point around, sorry my question is just moved as well, about the costs of upgrades and return on investment, because our estimated cost of upgrades and return on investments do vary across different jurisdictions and for different building types. The National Scorecard Initiative, the way the certificate for the Scorecard is currently communicated, it does indicate what those upgrades are, but I suppose in terms of return on investment, it does show what those savings are if you did take those actions, but it doesn't provide a specific here's the cost of that change. If we were to make that, because that does vary in different locations around Australia, but that's where with the trained assessors and with other information that can be taken from those assessments, it wouldn't be much to for people to be able to identify what are those costs and what are the benefits from those.

**Angela Newey**  
Thank you Jodie. Andrew, question for you.

**Question: On societal cost, were moving towards a renewable grid. When the toughest challenge will be, a cloudy winter week. On such a week, a home with high heating loads has a high societal cost, even if it has solar PV. These homes will need lots of expensive long term grid scale energy storage to supply their energy. Does Whole of Home consider this future scenario?**

**Andrew Law**  
This is a seriously good question because one of the things that makes me really happy about people asking this type of question is that it shows you are starting to think about how Whole of Home becomes a bit more of an energy balance kind of calculation. I'm actually going into this in a little bit more detail, specifically with some slides in my session at the CSIROs Energy Rating Conference on Friday. I think my sessions, the 12:00 o'clock one, so any of you who are coming along to that, come along to that as well and you might be able to ask me a few more specific questions having seen that slide show.

So, the societal cost metric and the NatHERS assessment does do an hour by hour calculation. So in theory we are able to counter for these weeks in the middle of winter where you might have higher energy loads but lower production loads and so your societal cost through that portion may actually jump quite quickly. How this scales into the need for network and energy grid kind of scale technology, I'm not super clear on right now, I think that will be something that the Department broadly will need to start considering over the next few years. But for the purposes of the NatHERS assessment, those calculations and the way in which those low solar production weeks and those heavy energy use weeks kind of play into it, should already be being accounted for. The slight disclaimer on all of this, of course, is that NatHERS is, certainly the Whole of Home assessment as it currently stands, is a simulation based calculation, which means we're only able to reflect as much influence as we have presented in our weather files, which is why we keep going through the process of reviewing and updating all of our input information and why we've done their climate file update that we’ve just done. So, over the course of the year as the solar generation potential rises and falls through summer and winter, those impacts should be reflected in the Whole of Home assessment. And that's a subtle cost calculation.

**Angela Newey**  
Thank you Andrew. Alright Dave, one for you.

**Question: Will software users need to enter the full timber framed and steel framed specifications to enable the thermally bridged difference to be identified?**

**David Rochford**  
Thanks Ange. The new thermal bridging proposals are quite complex, and one of the real complexities for NatHERS and NatHERS assessors, especially in places like NSW where planning approval documents are done extremely early where the plans are still very rough is that they won't have that information about exactly what the framing details will be. At best they are going to get that this is going to be a steel framed house or this is going to be a timber framed home, so therefore NatHERS has to be able to cope with that and there's a couple of ways we can do that. One will be that we have default values which we've already started consulting on, in terms of if you are an assessor and you don't know what it's going to be, or say, all you know is that it's a steel frame home and you don't know the thickness of the steel, the spacing of the studs or anything like that, we've got some default values that we have engaged with industry and those have been recommended and that's what we're proceeding with at the moment.

The thermal bridging proposal that's in NCC 2022 is quite a complex one. Many of you will know that Accurate has not in regulatory mode, so out of regulatory mode where you don't get a star rating. Accurate has long had a module where you can calculate the thermal bridging effects of steel or timber on any of the building that you want.

That’s I suppose, fairly easy and straightforward, because it's just the effect of the steel or the timber on the rating or the amount of energy that's going to be required. The NCC proposed policy is a little more complex in that it's proposing to only apply to steal, and to only apply to the effects of steel over and above that of timber. So it's effectively, if you have a seven star house and timber reduces it by half a star and steel reduces it by a full star, these are just numbers I’m pulling out of my head and they're nice and round so they're easy to work with, don't quote me on them. But in that situation, the proposed NCC policy is saying for steel frame, you ignore the bit that is being applied to by a timber house and you just get that extra bit. So that means the steel, even though if you just look at it by itself, it reduces by a whole star, but under their proposal you'd only look at the half star reduction, so that house would go to 6.5 stars.

So that's again in theory that that's pretty easy, but the implementation of that is going to be, we were still working exactly out how that will work, but one of the main points is like I said, we won't be able to expect that an assessor would know exactly what the wood frame would look like in a house, nor would they know exactly what the steel frame would look like in the same basic design, and they're certainly not going to know what both of them would look like for comparative purposes.

So they're the things we've got to take into account, but we're confident that we'll be able to get a fairly easy to use interface that will acknowledge that a lot of that information is not going to be known by an assessor and will come up with, the answer that equates to the NCC’s proposed policy. Bit of a long winded one that one, and so basically we've still got a little bit of work to do but we kind of know where we've got to get to, we’ve just got to make sure it's easy and implementable for assessors.

**Angela Newey**  
Great, thanks Dave. All right Andrew, another one for you.

**Question: Will it be the case that PV in Tasmania will be less beneficial because of climate and low carbon intensity of their grid?**

**Andrew Law**  
I'm really hesitant to provide or to make really concrete statements about how well given technology may or may not work in a given location. It is likely, though, given the lower production potential in Tasmania that you won't see as bigger jump for the same size solar PV system as you might see in say Brisbane.

But that doesn't mean that there's going to, it might be, once you go through and do your assessment and start playing with tool, it may be that it's still a really effective option for some of your particular design challenges. It's one of those really interesting things with NatHERS generally. I'm very hesitant to make blanket statements about what will or won't be good in a particular climate zone, and particularly I'm not as familiar with doing a lot of modelling work in Tasmania, but I think that, I can't remember who asked that question, sorry, but I think that you probably identified, that it's likely that that will be the case, but it won't necessarily be a guarantee. If you get a well oriented block, you might be able to get a really good outcome. You might see a very good improvement to your rating by adding some solar on.

**Jo Brennan**  
It's Jo here, I might just add a bit of a plug, we’ve put some indicative worked examples of ratings in different locations for the whole home rating, and they're available on the consultation hub, so feel free to have a look at those and see how the ratings differ with different scenarios, different sized PVs and different thermal shells. So they are still very indicative and very much subject to change and subject to the NCC decisions on stringency and other elements. But we did just want to provide some sense of what the ratings do when you select different appliance scenarios and PV in different areas around Australia.

**Andrew Law**  
And just to extend on that, we are also planning on doing a few more of those, once things are a little bit more solidified. And we can do a few more deep dives and some more really specific case studies, to step you through what the process might look like for a couple of very particular buildings in those locations. So if you've got any thoughts about what you would really like to see, let us know.

**Angela Newey**  
Thank you Andrew and Jo. Another question for you Andrew.

**Question: BASIX tools require you to have a BASIX certificate for a pool more than 40 kilolitres. In that case, will the Whole of Home assessment be required to accompany the BASIX certificate?**

**Andrew Law**  
I think again, this sort of comes down to the interaction between NatHERS and BASIX. And unfortunately, we can only provide information about the bits that we can control. Exactly how a BASIX assessment or the rules around what you will need to do for BASIX assessment interact with NatHERS is still is more in the control of New South Wales. So unfortunately I can't answer that one directly. That's probably one that will have to seek some more guidance from our New South Wales colleagues.

**Angela Newey**  
Thanks Andrew, another one for you.

**Question: Is it possible that enclosing of a veranda or balcony, might be refused if the assessment becomes negative?**

**Andrew Law**  
That’s interesting. I'd probably have to assume that when you say the assessment becomes negative, you mean that the assessment goes below that minimum thermal requirements. So Dave might want to throw some light on this as well. I don't think that NatHERS in our role would ever particularly outlaw a design solution. We only provide the measuring stick and some policy direction through things like the trajectory, the specific rules about what the stringency is etc. really comes down to the state and territory jurisdictions with their interaction with the NCC.

Particular design elements being refused probably comes down to how those rules get implemented at the building certifier stage. But as I say, I don't think NatHERS would ever outlaw anything in particular. And no one’s really in a position to, except maybe a couple of people at CSIRO to know whether something is intrinsically a bad item, that's why we have the Chenath engine doing all the calculations for us.

**David Rochford**  
Yeah, I don't really have much to say, I think Andrew you answered that pretty well.

But those sorts of covered in verandas, winter gardens, those types of things, we know Chenath doesn't model those perfectly in that it can't work-out where the sun is coming through that front window through the winter garden and then into another window, into your kitchen or whatever. So it doesn't, it's not ideal for those I suppose I would say, so we can kind of rate them, you could argue that we don't rate them as well as potentially they work in real life or in a way that reflects them in real life. But just to reiterate what Andrew said, we are the measuring stick, so we can't see us banning or mandating things like that. The measurement will be what it is, and then the regulators can judge whether that meets the requirements and for us that's the seven star mark or the six star mark or whatever it is that you're aiming for that’s set out in the NCC.

**Angela Newey**Thank you Dave and Andrew. Another one about pools Andrew.

**Question: Will you be looking at the reflectance of the pool on the homes interior?**

**Andrew Law**  
That's a really interesting question. The short answer is no. I think that for us to account for elements like that it's going to require a change to the way in which the thermal engine does its calculation. At the moment that's not on our radar, unfortunately. We've got a pretty long list of stuff to implement at this stage.

**David Rochford**  
Can I just add to that one, some of the tools you can set ground reflectance, so potentially you could do that to see. In Accurate I know can do that, but we've actually asked them to lock, all of the tools are asked and through the Tech Note you'll see the ground reflectance is set. Because it’s not something that people generally know and it's not something that comes on the plans - this site has a ground reflections of X or Y, so ground reflectance is actually locked in the thermal assessment and but if you wanted to play and we're really curious if you got your hands on just, you know, check whether your software tool out of regulatory mode can input ground reflectance. And then you could actually see what that does to a rating. And I don't mean to keep plugging Accurate because maybe some of the other software tools can do it, but I do know Accurate can do that for one out of regulatory mode so. But as Andrew said, not something we're assuming or planning on putting into the tool at the moment, a change for that.

**Andrew Law**  
You get to play with Accurate way more frequently.

**Angela Newey**  
Thank you Andrew and Dave. Another question about Whole of Home.

**Question: Does Whole of Home have a decrement rate on PV performance over time?**

**Andrew Law**  
That's again another really interesting question. I don't think so at this point in time, but I will have a read back over the solar PV calculation and just see whether one of those, there are a number of performance factors that we do include and I'll just have a look and check if one of those is a degradation factor to give you the average performance. The limitation again that we have, we only do the simulation based on a single year, so any of the performances that we do simulate are applied to that year. So if we are having a decrement rate for the solar PV, it would be reflected by an average number, not necessarily, we're not going to do 20 years worth of simulation and degrade the performance overtime. There's some things, unfortunately because we are in a modelling world, some of these things aren't quite perfect, but they're as good as we can make them at this time.

**Jo Brennan**  
And if you've got interest in the calculation methods, those documents and all the details about the assumptions and the various calculation algorithms are available for public comment at the moment, so I encourage anyone who's really interested in the detail around that to get in and have a look at those new proposed whole home calculation methods. And that includes for all the modules, so all the work that's available to date as Andrew’s mentioned we are continuing to sort of work through some additional issues, but we've really focused on what is needed for the NCC in terms of the priority modules and all of that’s available. So some really interesting work on hot water and pools. Seems we've had lots of questions about pools. So yes, have a read, provide your comments. We really welcome your feedback.

**Angela Newey**  
Thanks Jo. There's another one for you I think Jo, about assessors.

**Question: With so many new changes to the scheme, is there an opportunity to mandate all assessments are done by accredited assessors only, and remove non accredited assessors.**

Jo you or Jodie could answer this? Would you like to have a stab?

**Jo Brennan**  
I'll kick off and then I'll hand over to Jodie for the In Home, because this is probably where there's some potential differences. So for the Whole of Home we really are building on the arrangements in the current scheme, so all the arrangements in terms of assessor accreditation will just continue on as they currently stand, so that really is about how states and territories deem those requirements, and you know, we will be continuing to work through the assessor accrediting organisations for the Whole of Home assessor training and accreditation requirements. So really just building on the existing scheme and the current arrangements, so not trying to shake up and make major changes at this point, and Jodie might want to make some comments about the In Home assessors.

**Jodie Pipkorn**  
Yep, so in terms of NatHERS In Home assessors, we are requiring them to be accredited and this is particularly important because they are going into people’s homes. And there are different risks for assessors that are involved so we really do want to make sure that we are managing both the risks for the assessor and the risks for householders. So they are required to be accredited and that will continue going forwards. We are also, I suppose just flagging because cause it does sit in my team we are doing some work of exploring, just in terms of accreditation going forwards and with NatHERS as a whole just what those requirements are and where things are sitting, particularly as we move with the NatHERS In Home. So it's an ongoing conversation as to look at how do we best make sure that both consumers and clients are getting what they expect, and also that we are making sure that the assessors have access to the full information that accredited assessors have, so it is an ongoing conversation, but it is definitely for In Home assessors, a requirement that assessors will have to be accredited.

**Angela Newey**  
Thank you Jo and Jodie. Another question for you, Andrew.

**Question: Can electric vehicles be included in NatHERS Whole of Home assessments?**

**Andrew Law**  
Good question. Short answer at the moment for regulatory is no, we don't include the energy load of an electric vehicle in the Whole of Home assessment. We do have it on a list of things that we'd like to implement as some enhancements and updates. It's unlikely in the first instance certainly that this will make it into the Whole of Home rating and the regulatory side. The issue that electric vehicles raises for NatHERS and for residential house based assessments, is where you draw the box around what are what you are assessing. EV’s in particular, if we start including EV's in a home based assessment or an assessment of the houses energy rating, but don't include petrol engines in that rating, what's going to happen to the Whole of Home rating for those homes that do have EV’s or those people who own an EV is that their rating will probably go down because it will have some impact on their overall energy consumption in that home. Which means that there will be an unintended consequence for NatHERS of actually not rewarding people for having an EV.

And there is the question about whether or not NatHERS is the spot to be accounting for those things versus other areas in which vehicle emissions and vehicle energy consumption and fuel consumption gets reported. So we're hoping that we can bring it in for people who are interested and want to look at what the impact will be for them. Hopefully we can bring it into the tools in a non-regulatory sense as a non-mandatory option, something that you might be able to look at and be interested in. We have these sorts of modes in NatHERS for people wanting to just assess, you know what the temperature profile is going to look like in their home. If you want to do a free running assessment, you can do that. So in that same kind of vein, but it's unlikely certainly at this stage that will be bringing in electric vehicles as part of the overall rating in the Whole of Home system. Jodie, I don't know if you've got anything you want to add for In Home or if we have covered that?

**Jodie Pipkorn**  
No I think that's pretty much covered Andrew, and I think it is that same thing as to if you're trying to compare one home to the other, do you bring it into the rating or do you have it as additional information. One of the things that we do have on the In Home, or will have on the In Home certificate and what some of the information that the scorecard initiative currently has on its certificate is there is a box that says, here's additional information about this home. And I think it is one of those important things is that, like Andrew said, you can do it out of regulatory modes or you can have it for information as opposed to it becoming part of your rating. I think the thing too is again, if NatHERS is allowing comparisons between different buildings or what people need to improve, one of the challenges around electric vehicles is one owner may have an electric vehicle and the next owner doesn't and so it's how do you compare two houses in a similar fashion. So having it could be included if people wanted to know for their information purposes but not have it as part of the rating in the overall scheme may end up being where this lands, but it is one of those things like Andrew said, is it will be considered more into the future. It's on the the radar, and because we're doing this consultation now, it would be great to get input from people that if you do have particular views on this at this stage, or particular thoughts on what, it should be included and those sorts of considerations around that we would be happy to receive that sort of feedback to put in our forward work program.

**Angela Newey**  
Thank you Andrew and Jodie. Another question coming in via email Jodie.

**Question: Can you please clarify if In Home assessments can be used as an as built verification for a new home?**

**Jodie Pipkorn**  
In short, no, with how it's structured at the moment, the way In Home and as you will have seen in that video, is that because a lot of the things can't be seen in an In Home assessment, at this stage the focus for the In Home is really looking at those existing homes, and so it uses, I suppose a lot more assumptions, and it's a simplified process to try and reduce the time that it takes to do that In Home assessment, which means that it isn't as comprehensive as the current thermal assessment that NatHERS uses purely because it doesn't have all of that information. An as built assessment kind of fits in between the two. And it's like I mentioned a bit earlier, is that you can do a NatHERS as designed assessment when that's being built, you really want to make sure were all the things putting in as per that assessment or does it need to adjust. So that's where you can use a lot of that original information to feed into that as built assessment.

The In Home assessment is very much designed for walking around a building and what you can see or information you have, so you can do a more detailed assessment based on that, and you can look at plugging in potentially your rating from the thermal or Whole of Home assessment, but it is one of those things that's the In Home assessment really is designed for those existing homes where you don't have floor plans, and so as such it's been simplified, but with that means that it's not quite appropriate for that as built, so it's almost like a slightly different process, but that's where we as much as possible, trying to draw those threads between them and over time we will hopefully get a process which is pretty much seamless that you can go from one to the next as you've got that information your verifying it on site and then as changes are made you can build off those original assessments.

**Angela Newey**  
Thank you Jodie. All right, we have another question for you, Andrew.

**Question: Have you considered benchmarking a homes greenhouse gas emissions to include an environmental star rating alongside the Energy Star rating?**

**Andrew Law**  
The short answer is actually yes. We have considered a range of things that we might report on. Now in terms of producing this as a star rating, it gets a little bit murky with the number of ratings that are already in the marketplace, and then once we have NatHERS doing Whole of Home and In Home as well, you will have 3 NatHERS ratings systems.

Now it starts to become potentially a little bit congested, so we're really cautious about adding an additional scale and additional rating that people might confuse between the thermal shells star rating as it already exists, the Whole of Home rating for new build purposes, and then the In Home rating as well. Which is why at the moment we're looking at, on the certificate, just providing the carbon emissions position of the building, that carbon footprint of the building, and potentially looking at how we might be able to show you how that performs compared to an average of a building in your state or region or something along those lines. Rather than giving you another rating system to try and distinguish between and we just really want to be able to, particularly with this first change and because we've got a lot of changes coming into NatHERS and two brand new schemes, we don't want to kind of flood everyones brains with too many different rating schemes, like figure out which one of my actually looking at? Which one of these do I need for NCC purposes? Which ones do I need for the In Home? What am I looking at for disclosure? So we're trying to keep it as simple as possible, but still giving you as much of the information as we possibly can so that you can see what the impacts of these buildings are in all the different kind of arrays, and the different sort of aspects that you might be interested in.

**Jo Brennan**  
Thanks Andrew, I think that was really good. And it is actually one of the areas we are very keen to hear feedback from consumers and industry about what information would be useful on the certificate? And we're also doing some targeted market research with householders to get their views through focus groups and other appropriate methods. So we really are interested in what information, you know, if you're in the industry, what would be useful for you? And we are really interested to hear from certifiers and surveyors about what would really help them do their job and what information is best utilized in a regulatory sense, but really interested in those consumer views as well. So we trying to take a number of avenues to really gather that feedback so we can make sure it becomes part of the final design.

**Angela Newey**  
Thank you Jo and Andrew. So it is 3:28 now, we are happy to keep going. We have a lot more questions still that you've sent through and they're really great questions. So we're inclined to stay on until four to answer those questions, but if anyone does need to leave, this session is being recorded and it will be put on the web. But if you do have to leave, don't forget to take the survey. And if you want to hear the outcomes of the consultation and you're not already a member of our newsletter, you can join up for it to be a member of our newsletter and we will keep you informed.

OK, so for those who can stay on, we'll keep pressing on through these questions. So this one is for you, David.

**Question: Are true high performance homes in terms of sustainability and health, something NatHERS will work towards in the future?**

**David Rochford**  
I did see a question there and it may have been the same one and it was talking about insulation and the balance of heating and cooling loads and you can do things that make it perform better in winter and then that might impact what happens in summer. So one of the examples I did see people were talking about, I can't remember who that was sorry, mentioned waffle pods so those slab insulations that yes they do help with your winter heating, but they can in summer then impact your cooling loads as well, without that direct link to the earth. You're not able to absorb as much heat in the house through the floor, which is advantageous. So then, that led onto well shouldn't we be doing or looking at comfort and health and those sorts of things. So that is something that CSIRO are looking at for us. They are looking at and have been for a couple of years now, but it is very complex project. They're looking at developing a thermal comfort rating standard that applies to all the 69 NatHERS climate zones and could be part of a NatHERS assessment. So that a bit like some of the extra information at this point, that Whole of Home is talking about providing for you, outside of the regulatory framework, that could be one of the ways that NatHERS addresses those issues. In the meantime, of course we've got the split heating cooling load limits. So prior to NCC 2019, the NCC just required you to get six stars, if you were using the NatHERS pathway. So from 2019 onwards and this is planned to be continued for 2022, there's also those additional requirements so that, to try and balance out some of those situations where a house has been designed specifically to perform extremely well in one season and then leave it a bit weak and the other, but overall it passes because it does really, really well in winter, even if it's summer performance isn't that great. So that policy on the split heating and cooling loads was introduced to try and get rid of, it was only a trim at either end, the worst 5% overheating homes and the worst 5% overcooling homes. So that was one policy that was put in to try and mitigate that a little bit.

Hopefully in the not too distant future we will have a thermal comfort rating standard and will be able to use that in many ways, not just as part of a NatHERS assessment as it is now, but that could be, for instance, used to start looking at resilience issues. If the electricity goes down for, a week or whatever, how comfortable is that house? Does it get dangerously hot or dangerously cold really quickly compared to some better designs? We could also use it to potentially rate free running homes. Things like mud-brick homes, troppo design homes that are designed to operate adequately without heating or cooling. So with the comfort standard, we could test that.

And say does this house, if it has no air conditioner or heater, does it remain comfortable to some sort of threshold. And we'd have to decide what that threshold is, is that if you're overheat for one hour a year is that acceptable? Is it acceptable for 10, 15, 20? What's acceptable? But that is something that CSIRO are playing with. So we're all looking forward to seeing the results of that and how we can incorporate it into NatHERS and to make the scheme better and give it more uses for more people as well.

**Angela Newey**  
Thanks Dave, so the next question, it could be a Whole of Home or a thermal question, Dave and Andrew?

**Question: will there be an option in Whole of Home to choose no mechanical heating and cooling for a house that has a high thermal performance star rating?**

**Andrew Law**  
This follows on really nicely from what David was just talking about actually. So the way in which the NatHERS tools will currently work, and it's not, where it sort of differs a little bit, is that when the Chenath engine deems that you require some mechanical heating or cooling to be added to the zone in order to maintain the comfort bands that NatHERS works with, we need to account for that energy in some way.

Now for Whole of Home, you don't have to specify any heating and cooling if you don't want to. But we still need to do something with that energy load that's being calculated. That's part of what we need to do to maintain a fair assessment so that you don't have two homes that are exactly the same, one of them chooses to not put in any heating and cooling, and the other one does, and the one that does ends up not passing the NCC provisions just because they've decided at point of construction, not to put in an air conditioner or a heater. So we have in the provisions at the moment for NatHERS, a series of defaults that we will apply if either assessors don't know what equipment is going to go in, or if there is a room that has a heating or cooling load but has no equipment specified.

Now in the future, hopefully what we can do is be a little bit more nuanced with that and a little bit smarter and be able to take advantage of things that CSIRO are working on now, with this comfort rating style assessment where we can be a little bit better at being able to distinguish between homes that are high performance and do not have any heating and cooling and don't need even for those little bits of energy that the Chenath engine under its current settings is sort of suggesting you're going to require. And we can sort of move into more of that space.

The other point to make is that if you do have a 9 or a 10 star home, your engine loads are going to be very, very small and the Whole of Home assessment will reflect the fact that those energy loads are very, very small. I think I did see a question coming in earlier about how the Whole of Home assessment will use the Chenath engine results, and it is exactly that. It is picking up, we have a slightly different set of settings, but it is picking up the hourly energy calculation that's coming out of Chenath. And using that as the basis to then apply the appliance efficiencies to and then calculate the fuel requirements for that room. So if you do have a room that only requires one megajoule of electricity or one megajoule of heat per year, the thermal energy that you require or the electrical energy that you require to heat that space will be based on that very small energy load.

**David Rochford**  
And I suppose just to add to that, to take it to its logical conclusion then, if you do have a high performing, thermally high performing house that only needs that one or two mega joules per annum, and you don't want to include an air conditioner or a heater using the defaults in this situation, is probably not going to penalize you, because you'll still make, you'll still meet the benchmark for that pass mark on your Whole of Home aspects, if even if you just go for the default heater or cooler if you've got a high performing house, that I suppose becomes an option at some point.

**Andrew Law**  
And this is actually exactly one of the things we were looking at trying to do, in the early parts of next year is actually provides some more detailed case studies of what Whole of Home looks like for those high and very high rated thermal performance homes. So you can see exactly how that changes.

**Angela Newey**  
Thank you Dave and Andrew. This one relates to solar PV, Andrew.

**Question: What if a new neighbours’ development, casts shadows to deny solar access?**

**Andrew Law**  
Really good question. So the short answer is shading on solar is really complex. Depending on what your solar PV system is, that in itself can have a really big impact. If you've got a series of micro inverters on each individual panel and versus if you just got one inverter sitting on the overall array. If you get a little bit of shading on your micro inverters, you'll get a little bit of drop, if you have some shading on the overall array, you see a lot bigger drop.

In order to get that into the tools right now, it's exceedingly complex. NatHERS, this actually probably speaks to another question that has come through, that at the moment NatHERS does nothing to deal with shading on roof surfaces. That's a part of the tool that I think we've asked Dong to have a bit of a look at from CSIRO. But at the moment, the way things stand we don't deal with any of the shading on the roof surfaces. We have got a method written up for how we might be able to account for shading on solar PV, so you can see the variation that happens, if you do have say a building next to you that is going to cast shade on your system for a particular part of the day. However, implementing that into the tools will be complicated. The number of questions that we would have to ask assessors right now will be very complicated, and at the moment the modelling that was done that accounts for solar in the NCCs DTS elemental provisions, didn't account for any shading provisions. Which would mean that NatHERS assessments would be significantly disadvantaged by entering the detailed calculation information.

So at this point, we’re noting it for the future, we need to do a bit more research on exactly how we can implement the shading calculations on the solar PV systems. What that does to the solar PV, the predicted output of our systems, and how we might be able to simplify that down so that it's actually easy to use and useful tool for assessors to be able to implement in their assessments. Otherwise, it's going to be something that I would expect people will look at and decide that it's a lot harder to do a NatHERS assessment and choose another pathway that doesn't require you to account for that. Which is an unfortunate tension of where we're sitting right now.

**Angela Newey**  
So we have an interesting question here. I think it relates to Jo and Jodie's areas.

**Question: In most states it is the building surveyor that determines the suitability and accuracy of the report. Do they get mandated training in assessing Whole of Home reports or In House? Or are they simply to rely on NatHERS and certificate records for reference?**

**Jo Brennan**  
Thanks for that question Ange, it’s a really good question.

We're not mandating any training for certifiers or regulators or surveyors. But we are strongly encouraging engagement with the peak bodies. And, we often talk to the variety of peek bodies through the ABCB or the Australian Building Codes Board office processes as well. So we do look for as many opportunities to raise awareness and talk about the changes to NatHERS. I think, probably one of the real benefits in the NatHERS assessment and the NatHERS accredited certificate is the fact that there are range of compliance tools there. There's the QR code to check whether it's a verified certificate, it's a simple rating, is the other thing we're designing to make it simple like the current star rating approach to try and make it a really streamlined approach for certifiers and surveyors. Who are then able to really rely on those professional accredited NatHERS assessors doing their energy assessments and being trained and quality assured in those processes. So that's the sort of underpinning, and we’ll continue to work through this process. One of the things we've actually put out is some, I suppose we're seeking learning needs or industry transition. Views on industry transition materials that would support the various sectors to transition to Whole of Home assessments. So we very much welcome any certifiers, surveyors and the regulators views, as part of this consultation in terms of what they might want to see us rolling out to support the changes for NCC and Whole of Home assessments.

**Jodie Pipkorn**  
And I'll just add for I suppose the In Home component, because at the moment there's no mandation of In Home assessments. The certifiers aren't engaged in that process, so it's very much, as Jo said, it's related to that National Construction Code process as opposed to the In Home. So we're not working with certifiers or surveyors on the In Home processes at the moment. But like Jo said, we are with all of our processes looking at what does that transition to In Home look like, and so we have actually released that document as part of the consultation, and we would be keen to hear from people who are considering becoming an In Home assessor, or if you are already an In Home assessor, just hearing from you as to what are some of the considerations we need to take into account, we'd be really keen to get your feedback.

**Angela Newey**  
Thank you. So we do have a lot more great questions still here to get through. We will try to get through, we might try and be a little bit quicker with our answers, but any questions we don't get too we will. I guess we'll put something on our website, sort of FAQ's responses to unanswered questions. So you will get an answer. But we will press on to get through as many more before 4pm. OK, so the next question Andrew, is for you.

**Question: Looking at the Whole of Home example ratings, it seems many of the homes get to 100% with only three kilowatts of PV panels. That seems a bit low in my experience from Melbourne. Has this been checked against real life built homes?**

**Andrew Law**  
That's a really good question. I think that was Jeremy who asked that and so well spotted. And thanks for having a look through those. Those particular work examples and the way in which that rating scale works at the moment, is indicative. We haven't had a chance to test it against real world homes. If anyone’s got some data sets that they would like to share with me to be able to do that, I would love it.

The way in which that particular rating is working at the moment is applying the same principles as was done for the NCC work, so the calculation itself is based on regulated energy and the plug loads are being included for the purposes of figuring out how much of the solar PV is being exported. So those PV numbers probably look a little bit low if you were to compare them to something that is a true net zero building. Particularly in Melbourne, because it's not really assessing the overall net zero position of the building. It's looking really specifically at the regulated energy.

Noting that we've only got 15 minutes, I'll try not to get into too much more of that detail, but Jeremy, please hit me up again if you want to have a more detailed discussion on that, and hopefully I'll go through a little bit, I might have a bit more of a chance in the next couple of weeks as well.

**Angela Newey**  
Thanks Andrew, next question also for you.

**Question: How does NatHERS Whole of Home rating align with the net equivalent energy use allowance as detailed in the ABCB Whole of Home calculator?**

**Andrew Law**  
Sure. So at the end of the day, one of the numbers on that rating scale from zero to 100 will be the point at which you have met that budget. And so instead of saying your budget is this and you need to get to this point, because the way the NCC calculator works, it gives you a number and a target. One particular value, and it will be the same across all of the climate zones, will represent the point at which you have met that budget for the Whole of Home rating. So at the moment we're pitching that that might be somewhere around about the 60 out of 100 mark, but we do need to do a bit more work to see exactly how that will work, both for being able to represent our In Home assessments and the existing building section of the market, because we don't necessarily want them all just lumped in one particular spot, but also given enough room to showcase the buildings that are exceeding those minimum standards as well.

**Angela Newey**  
Thanks Andrew

**Question: is it correct to assume that the NatHERS Whole of Home tool will utilize the actual heating and cooling loads from the thermal assessment, whereas the ABCB Whole of Home calculator will have to utilize the load limits as per the NCC for calculations.**

**Andrew Law**  
Yes, that's pretty much correct. So the NCC Whole of Home calculator assumes that you have a thermal shell that has met but not exceeded those minimum thermal performance standards. So it's a seven star equivalent, whereas if you exceed those thermal shell standards for NatHERS, so you get to seven and a half, or eight or nine stars, the Whole of Home assessment will account for that lower energy consumption requirement, or that lower energy load rather, of the building.

**Angela Newey**  
Another Whole of Home question Andrew.

**Question: If solar panels shade the roof, the roof space will be cooler, and the house will use less cooling energy and more heating energy. Why has this not been added back into NatHERS thermal as an amendment simulation?**

**Andrew Law**  
So I sort of touched on this before, that we don't really have the capability in the Chenath engine right now to do that kind of calculation. I believe that it's quite complex. That's not to say that we don't want to do it because you're right, it does make a difference, but it's something that we just haven't really been able to deal with to this point. We have a very large work program and so does the CSIRO, particularly with making changes such as thermal bridging into the scheme, and this is something that unfortunately just hasn't risen to the top of the pilot stage.

**Angela Newey**  
Another one Andrew.

**Question: Can Whole of Home be done for units in multi-unit apartments and also whole apartment buildings?**

**Andrew Law**  
Short answer is yes, it will operate in much the same way as the current scheme does, so you will be doing an apartment by apartment assessment and then will be presenting the information about the whole building on a summary certificate. The specific provisions will still be not totally settled right up until the point which we know exactly what the NCC provisions look like though.That'll be very similar to the process that you currently follow.

**Angela Newey**  
So, just working through these questions, I'll just read this one out. It's Mahalath’s question, it relates to where the cooling is assumed and thus a home, not using cooling has a rating that assumes cooling will occur.

**Andrew Law**  
Yeah, and so and again, this sort of speaks to the difference between a home that is designed to be free running and meets all of the comfort requirements and is comfortable throughout the whole year without any calling, versus something where the occupant has decided that they're OK with it being a little bit hotter or a little bit colder and doesn't want to put in a heating and cooling system, we still have to maintain sort of that level playing field for NatHERS, if the design does fall outside of those comfort bands and the Chenath engine calculates an amount of cooling energy that's required. We will be including it in the assessment. I should say that the way in which that's being done is by assuming a MEPS equivalent heat pump, so it's not amazing, but it's not the worst, so it's still going to be accounted for in some way. Consider it the penalty, I guess, for falling outside of those comfort bands or we need to be able to deal with that in some way.

**Angela Newey**  
Thank you, Andrew. Jo, this one’s for you.

**Question: Is the NatHERS Whole of Home tool only accessible for accredited assessors or will unaccredited assessors be able to utilize the tool as well?**

**Jo Brennan**  
Thanks, Ange. So, I think I've sort of touched on this earlier as well. Look, the current process for access to tools will continue as per the arrangements for the thermal tools. So that will also then depend on which thermal tools and decide to move to the whole home expansion. At this stage we've had indications from the current NatHERS accredited tools that they'll be looking to move to develop the Whole of Home modules. Those software accreditation processes, are yet to be undertaken. So really no change there. Assessors will be able to access tools as they currently do. And in terms of software accreditation for Whole of Home, you know, one of the key requirements will be that you have to be able to be thermally accredited before you can move to your Whole of Home accreditation. So obviously tools that already have thermal accreditation are well positioned to move into that whole home accreditation, probably more quickly and easily because I've already got that thermal accreditation. So in terms of assessor access, no change to the current process and arrangements.

**Andrew Law**  
I think just really quickly, just to reiterate, for people who are looking to access SV’s tool, you will have to go through their own training processes. That's just to make sure that you're up to date with how the tool actually works and can give them sort of good feedback about the bits and pieces that you're playing with.

**Angela Newey**Well, I think we have come to the end of our list of questions, which is magnificent timing. Any more questions? Any last questions, burning questions?

Claire, did you want to pop on that slide? Claire’s just going to pop on the contact details. So I will wrap it up then. Thank you very much everybody for joining us today. Really, really fabulous questions. We really do value your feedback so please do go online and take our survey or make a submission.

If you would like to recap on any of the any of the content covered today, this video and the questions will be put online shortly. And yes, you can join up for our newsletter to ultimately find out the outcomes of the whole consultation that will be early next year.

So, can you find that slide Claire? It's coming, it's coming. Alright so we'll just leave you with the slide that has the details to access the survey and the newsletter. Thanks, Claire.

Ah, OK, so I've just been reminded to tell people that the other information session that we had last week, which was sort of more of an overview of the regulatory changes and also the In Home changes that is also already available on our website. The slides are, and for today. So that’s really all from us. Thank you very much. See you again another time.

**Jo Brennan**  
Thanks everyone for the great questions.