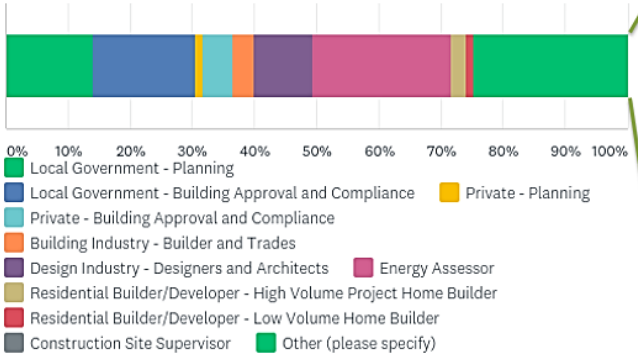
Question 1

Which profession do you identify with the most?

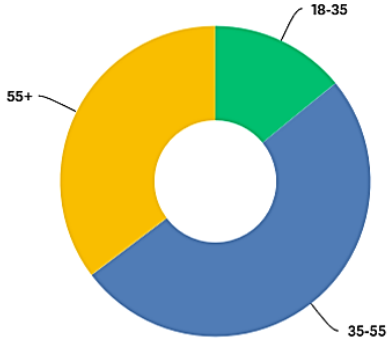


- esd consultant
- Built Environment Research
- NatHERS Architectural Science
- Manager Energy and Carbon - policy
- Construction technology startup
- Building products
- Material manufacture and supply
- Research engineer
- Electrical engineer
- ESD Consultant
- Energy Engineer and Energy Manager
- University Researcher
- Building Surveyor
- State Government - Policy
- Designer, TAFE Lecturer and Council Assessment Panel Member
- Sustainability Expert
- State government employee
- State Government- Policy
- Environment NFP - consumer advocacy
- Educator in the building and construction industry
- Training, accreditation and auditing of energy raters

Affirmative Observations	Large percentages of respondents from 'Local government (planning, Building approval and compliance)' and 'energy assessor' categories
Negative Observations	Low representation from 'Private (Planning, Building approval and compliance)', 'builders and trades', and 'residential builder/developer (High & Low volume home builder)' sectors
Recommendations	There is a need to engage with Private (Planning, building approval and compliance) to test the recommendations

Question 2

What age bracket do you belong to?

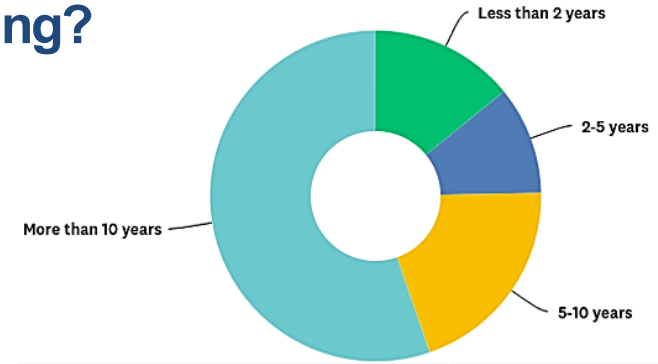


ANSWER CHOICES	RESPONSES
18-35	14.12%
35-55	50.59%
55+	35.29%

Affirmative Observations	Large percentage over 35, which implies they are experienced
Recommendations	A targeted approach to consider the recommendations of those in the 18-35 category may be worthwhile across education and compliance as they are the future of the industry

Question 3

Q3: How many years have you personally been involved in energy rating, approval or building compliance in the construction industry for Class 1 housing?

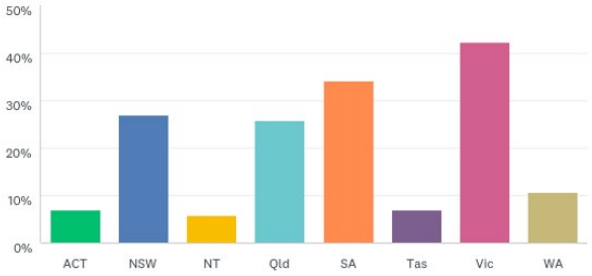


ANSWER CHOICES	RESPONSES
Less than 2 years	14.12%
2-5 years	10.59%
5-10 years	20.00%
More than 10 years	55.29%

Affirmative Observations	Large percentage above 5 years, which implies they are experienced
Recommendations	With low percentage of less experienced people linked to Q2 may be of interest to target less experienced and younger age group on the recommendation actions

Question 4

Which State(s) do you mainly operate in? (Select all that apply)

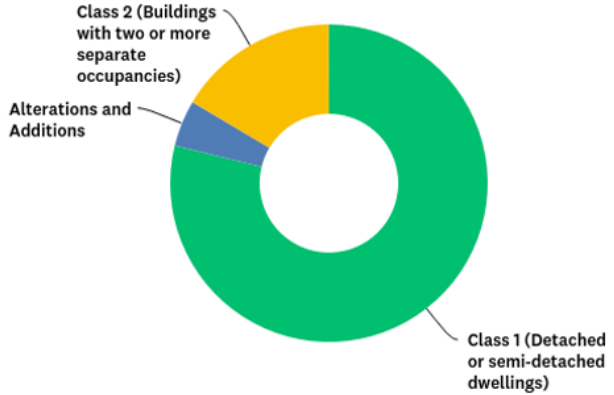


ANSWER CHOICES	RESPONSES
ACT	7.06%
NSW	27.06%
NT	5.88%
Qld	25.88%
SA	34.12%
Tas	7.06%
Vic	42.35%
WA	10.59%

Affirmative Observations	Largest representation from Vic, then SA, NSW, Qld
Negative Observations	Low representation in ACT, NT, TAS and WA
Recommendations	Due to the underrepresentation in ACT, NT, TAS and WA, further, targeted research may be necessary

Question 6

Please indicate the type of construction that you feel most experienced to comment on.



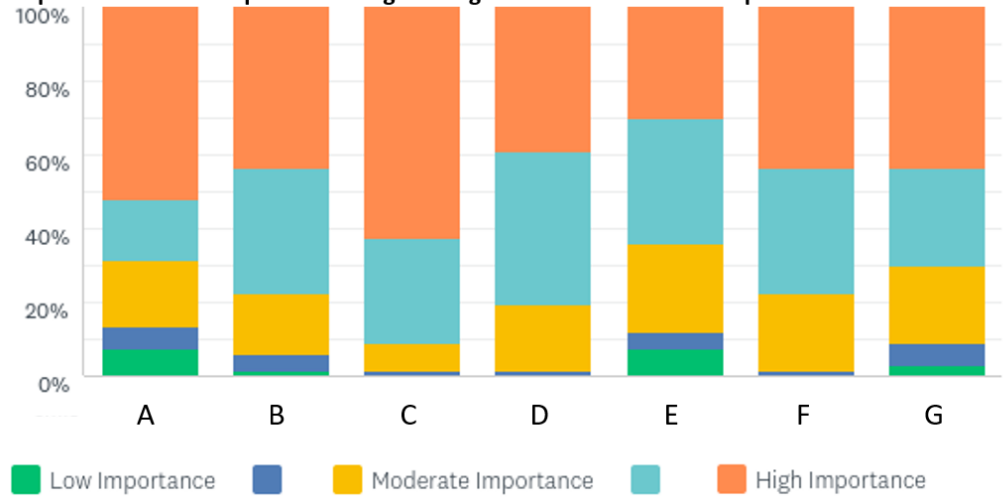
ANSWER CHOICES	RESPONSES
Class 1 (Detached or semi-detached dwellings)	78.82%
Alterations and Additions	4.71%
Class 2 (Buildings with two or more separate occupancies)	16.47%

Affirmative Observations	Survey aimed at Class 1 and over 75% said that it was the sector they were most experienced to comment on
Recommendations	While the survey represents class one housing there is a need to test applicability and replicability with class 2 apartments as even though the some may be trasnfe3rbale this needs to be tested

Question 7

What level of importance would you assign to the following reasons for committing to residential energy efficiency compliance?

Graph 4.2-i: Level of importance assigned to given motivations for compliance



A	Reduction of carbon emission
B	Encourage better design
C	Reduce heating and cooling demands (i.e. lower bills)
D	Improve people's quality of life
E	Reduce load on the grid
F	Improve internal comfort
G	To create a positive market for energy efficiency compliance
H	Other (please specify)

Question 7

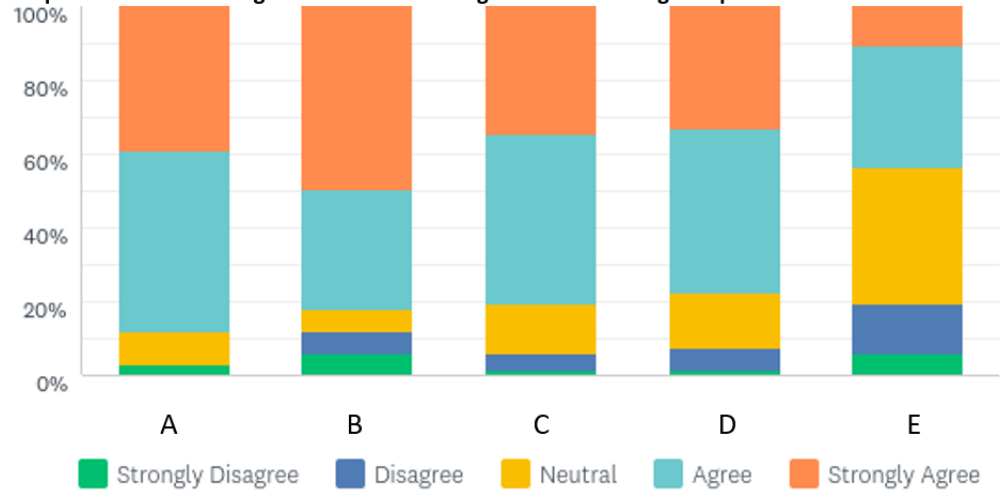
What level of importance would you assign to the following reasons for committing to residential energy efficiency compliance?

Affirmative Observations	The highest level of importance for committing to residential energy efficiency compliance overall was given to 'reducing heating and cooling demands' All options bar 'improving people's quality of life' received a weighted average of 4 or over
Interesting Observations	'Reduction of carbon emission' received the equal-highest 'Low importance' responses and the second highest 'High importance' responses – though the high far outnumbered the low
Negative Observations	'Reducing load on the grid' is seen as the least important issue
Recommendations	Opportunity to provide consumer awareness on the value of energy efficiency compliance in reducing heating cooling loads, improving quality of life and reducing power bills

Question 8

In your experience, to what extent do you agree or disagree that the following are affecting energy efficiency compliance?

Graph 4.2-ii: Extent of agreement that issues given are affecting compliance



A	"As-built" does not meet "as-designed and rated"
B	No mechanism to check compliance with code
C	Knowledge and understanding across the industry
D	Cost implications and market competition affecting quality control
E	Costs associated with meeting energy efficiency compliance may be treated as a variation after contract is signed

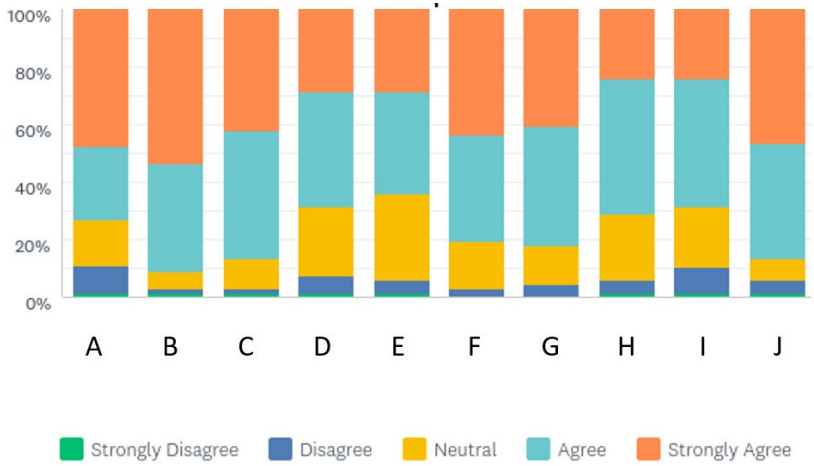
Question 8

In your experience, to what extent do you agree or disagree that the following are affecting energy efficiency compliance?

Affirmative Observations	Over 85% of those surveyed agreed (~40% strongly) that when 'as-built does not meet as-designed-and-rated' energy efficiency compliance is affected 50% strongly agreed that there was 'no mechanism to check compliance with code'
Weighted Average Observations	All options received a weighted average over 4 (where agreement is high) bar the last option around cost variation
Negative Observations	The least agreed upon factor was that 'costs associated with meeting energy efficiency compliance may be treated as a variation after contract is signed' with 37% of responses neutral, and only 43% at least agreeing
Recommendations	State government consumer affairs could promote that contract variation for energy efficiency is technically illegal / malpractice Maintain strong focus on independent inspection and audit regime during construction phase Need to develop systematic regime to check energy efficiency compliance with the Code Capacity building and resources are an essential component in improving energy efficiency compliance

Question 10

To what extent do you agree or disagree that the following would enhance energy efficiency compliance?



A	Improved regulations	F	Clearer responsibility and understanding by professionals and trades across the building cycle
B	Increased capacity to carry out inspections and assessment	G	Better awareness of energy efficiency compliance requirements and cost and performance implications of non-compliance
C	Increased resources to support energy efficiency compliance across industry regulators and assessors	H	Easier access to quality data on energy efficiency compliance and as-built performance
D	Greater consistency in energy efficiency rating	I	Better systems and tools that enable regulators and industry to meet compliance more easily
E	More time to focus on compliance in building design and approval stages	J	Clearly identified and defined accountability of industry, regulators and assessors to deliver high performance homes

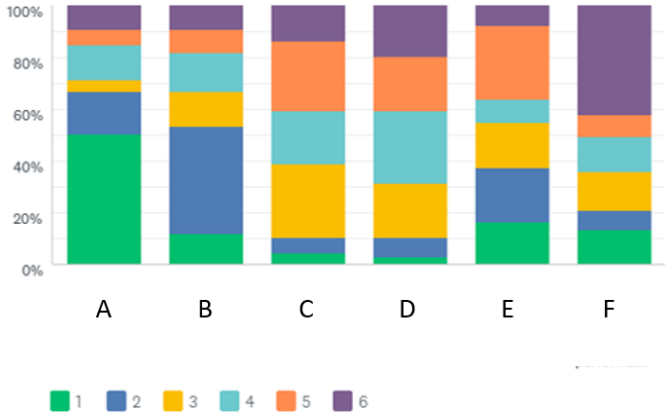
Question 10

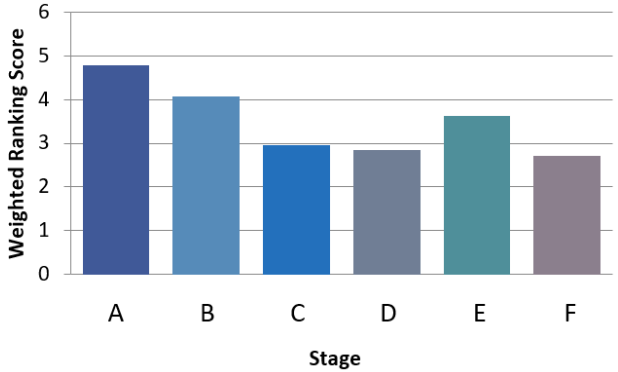
To what extent do you agree or disagree that the following would enhance energy efficiency compliance?

Affirmative Observations	Over 90% agree (53% strongly) that 'increased capacity to carry out inspections and assessment' would enhance energy efficiency compliance It was also widely agreed that 'clearly identified and defined accountability of industry, regulators and assessors to deliver high performance homes' and 'increased resources to support energy efficiency compliance across industry, regulators and assessors' would enhance energy efficiency compliance Very low responses of strong disagreement for all options
Weighted Average Observations	'Greater consistency in energy efficiency rating', 'More time to focus on compliance in building design and approval stages', 'Easier access to quality data on energy efficiency compliance and as-built performance', and 'Better systems and tools that enable regulators and industry to meet compliance more easily' – had an average between 3 and 4, all others were above 4
Negative Observations	'Improved regulations' and 'better systems and tools that enable regulators and industry to meet compliance more easily' had the highest levels of disagreement
Recommendations	Construction phase energy inspections (not random. set stages) Mandating who does these inspections Clarify what independent needs to be Targeted capacity building for different stakeholders

Question 11

When is the most critical time at which energy efficiency compliance and performance should be assessed? Rank 1 (most) to 6 (least) important





A	Design and rating stage	D	Construction, during second fix
B	Development and building approval stage	E	After construction, prior to handover
C	Construction, during first fix	F	Post-occupancy (e.g. 12 months) performance review

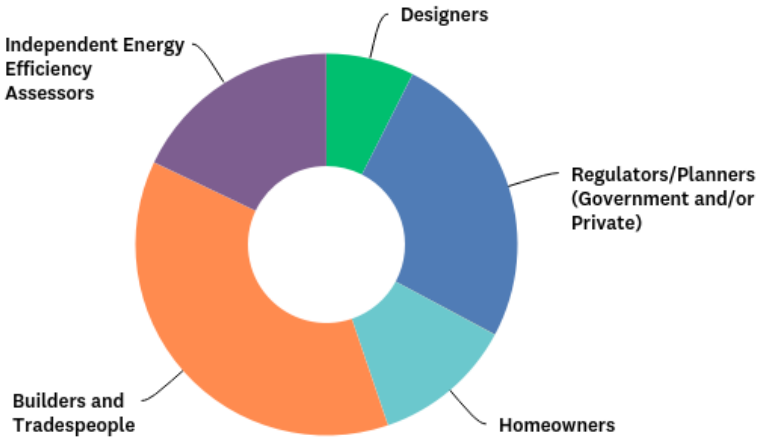
Question 11

When is the most critical time at which energy efficiency compliance and performance should be assessed? Rank 1 (most) to 6 (least) important

Affirmative Observations	'Design and rating stage' was rated highest overall, followed by the 'development and building approval stage' and 'after construction, prior to handover' option – and thus are the most critical times for energy efficiency compliance/performance to be assessed
Negative Observations	'Post occupancy performance review' was deemed least critical for compliance/performance testing
Recommendations	Introduce mandatory additional verification inspections Emphasise systems and mandated in as built Revisit need @ first fix /sec fix to achieve better outcomes (post construction is to late) Need to address issues at three stages • Design development approval …energy efficiency must be part of contract and on plans • During construction stage audit inspection regime should be mandated at agreed times • Checked prior to handover for occupancy

Question 12

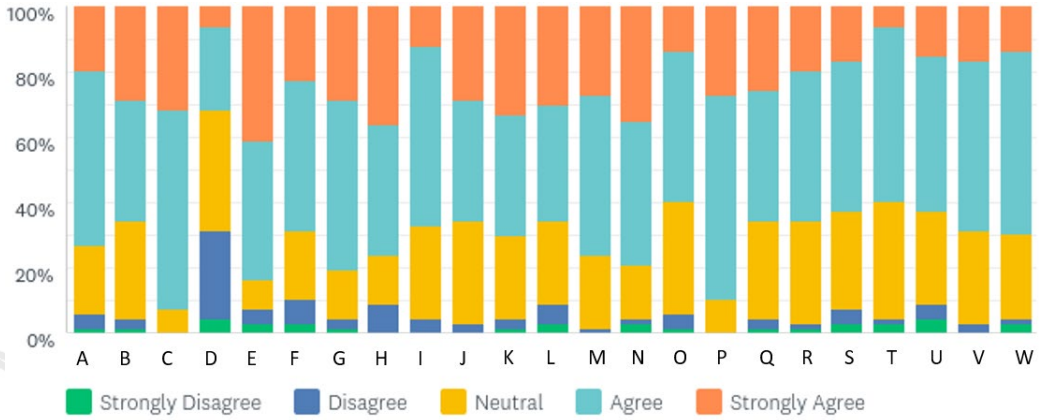
Who do you believe should be legally responsible for ensuring energy efficiency compliance? (Select one only).



Affirmative Observations	Builders and tradespeople had the most responses
Interesting Observations	12% saying that homeowners should be legally responsible for energy efficiency compliance seems high…
Negative Observations	Designers had the least responses
Recommendations	Through building contracts builder is to be made responsible for compliance Strength warranty insurance to specifically cover energy efficiency compliance Need to streamline to ensure transfer of information is consistent and efficient

Question 13

To what extent do you agree or disagree that the following systems and tools would be useful in improving energy efficiency compliance?



A	Improved and easy to use checklist tools	M	Consistent trade accreditation
B	Clearer regulation and legislation	N	Routine on-site task validation and sign-off
C	Knowledge and Training for Professionals	O	On-site data access for builders, regulators and industry
D	Voluntary auditing tools	P	Consistent code of practice for energy efficiency assessors
E	Mandatory auditing tools	Q	Quality assurance system
F	Electronic documentation and verification	R	On-site product verification
G	Auditing of energy efficiency assessments	S	System to track compliant specification and installation of fit-for-purpose products
H	Consumer awareness	T	Better documentation storage, retrieval and access
I	Consumer protection protocols	U	Compliance QA system for professionals, tradespeople and specifiers
J	Transparent and accessible data	V	Consistent systems and tools for identifying non-compliance and tracking remediation and completion
K	Consistent real estate identification and ranking for energy efficiency	W	Consistent systems for tracking remediation and completion
L	Thermal envelope testing		

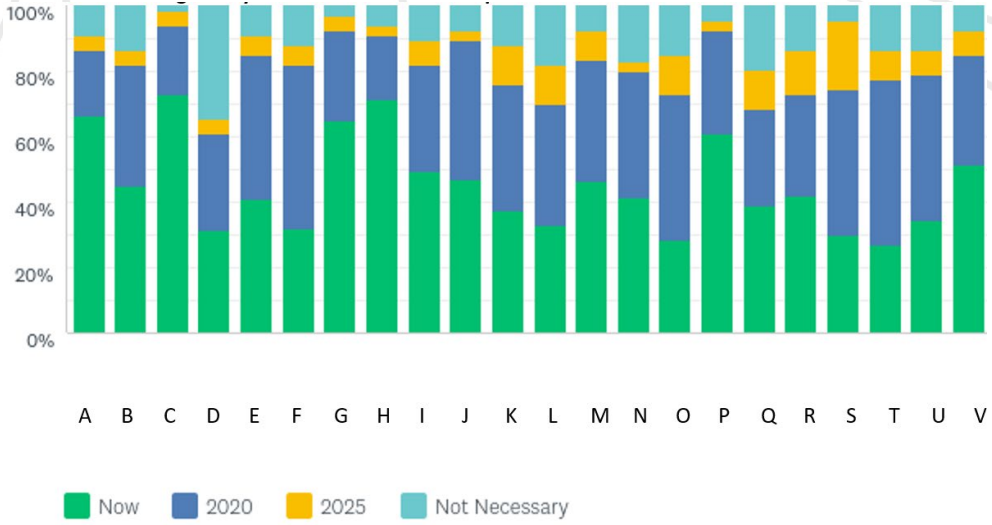
Question 13

To what extent do you agree or disagree that the following systems and tools would be useful in improving energy efficiency compliance?

Affirmative Observations	‘Knowledge and training for professionals’ & ‘consistent code of practice for energy efficiency assessors’ most widely agreed upon as the most useful in improving energy efficiency compliance ‘Mandatory auditing tools’, ‘Auditing of energy efficiency assessments’, ‘Consumer awareness’, ‘Consistent trade accreditation’, ‘Routine on-site task validation and sign-off’ are the next highest in terms of agreement (strongly or otherwise) ‘Mandatory auditing tools’ had highest strong agreement
Negative Observations	‘Voluntary auditing tools’ most widely disagreed with and as such least likely to be useful in improving energy efficiency compliance
Recommendations	Pre-occupant sign off by independent accredited person Mandatory auditing tools Increased knowledge and awareness training on energy efficiency Consistent code of practice to deliver energy efficiency compliance

Question 14

By when should the following actions, systems and tools be implemented to effectively enhance energy efficiency compliance? (or not)



A	Improved and easy to use checklist tools	L	Thermal envelope testing
B	Better regulation and legislation	M	Trade accreditation
C	Knowledge and Training for Professionals	N	Task validation/sign-off
D	Voluntary auditing tools	O	On-site accessible data program for builders, regulators and industry
E	Mandatory auditing tools	P	Consistent code of practice for energy efficiency assessors
F	Electronic documentation and verification	Q	Quality assurance system
G	Auditing of energy efficiency assessments	R	On-site product verification
H	Consumer awareness	S	System to track compliance, performance and fit-for-purpose installation of products
I	Consumer protection protocols	T	Better documentation storage, retrieval and access
J	Transparency of data	U	QA for EE for compliance professionals, tradespeople and specifiers
K	Consistent real estate guidelines for energy efficiency	V	Systems and tools for correcting non-compliance

Question 14

By when should the following actions, systems and tools be implemented to effectively enhance energy efficiency compliance? (or not)

Observations for Now	'Knowledge and training for professionals' (3), 'Auditing of energy efficiency assessments' (7), 'Consumer awareness' (8), 'Improved and easy to use checklist tools (1)' and 'Consistent code of practice for energy efficiency assessors' all had over 60% of their responses indicating they should be implemented now. Only three of the actions were found to have less than 30% of support for implementation now, none less than 25%.
Observations for 2020	All bar 'Voluntary auditing' (4), 'Thermal envelope testing', 'Quality assurance system' (-6) and 'On site product verification' (-5) had over 70% of responses suggesting that they should be implemented by 2020 or earlier.
Observations for 2025	Timeframe with the lowest percentages, only 'System to track compliance, performance and fit-for-purpose installation of products'(-4) had more responses at this year than 'not necessary', none had more responses for 2025 than for the timeframes of now and 2020 – this implies that at the very least these actions should all be implemented by 2020, if they are necessary, and a 'System to track compliance, performance and fit-for-purpose installation of products' can be implemented by 2025 if it hasn't already
Negative Observations	'Voluntary auditing tools' had the most responses indicating that it was not necessary, and some of the lowest responses for the individual timeframes
Recommendations	Mandatory Auditing, knowledge and training and consumer awareness introduced now On site product verification and substitution product regimes should be considered for 2020/2025 Voluntary auditing and self-regulation less likely to achieve energy efficiency compliance

Question 15

In a previous project, the following products or design elements were identified as critical factors in ensuring residential energy efficiency compliance. If they were used as part of an audit system to check that they met design specification and energy rating, what priority level for checking compliance would you assign each element?

A	Correct roof insulation supplied	I	Dampers on exhaust fans correctly specified and installed
B	Roof insulation well installed	J	Orientation and layout maximised for passive solar design
C	Roof sarking or equivalent correctly specified and installed (reflective moisture barrier)	K	Appropriate external shading installed as-designed
D	Correct wall and underfloor insulation supplied	L	Lighting installed as per approved lighting plan
E	Wall and underfloor insulation well installed	M	Hot water system correctly specified and installed
F	Correct windows supplied	N	Heating, ventilation and cooling (HVAC) correctly specified and installed
G	Correct roofing (including colour) supplied	O	Other (please specify)
H	Well-sealed thermal envelope (Roof, wall, window and floor)		

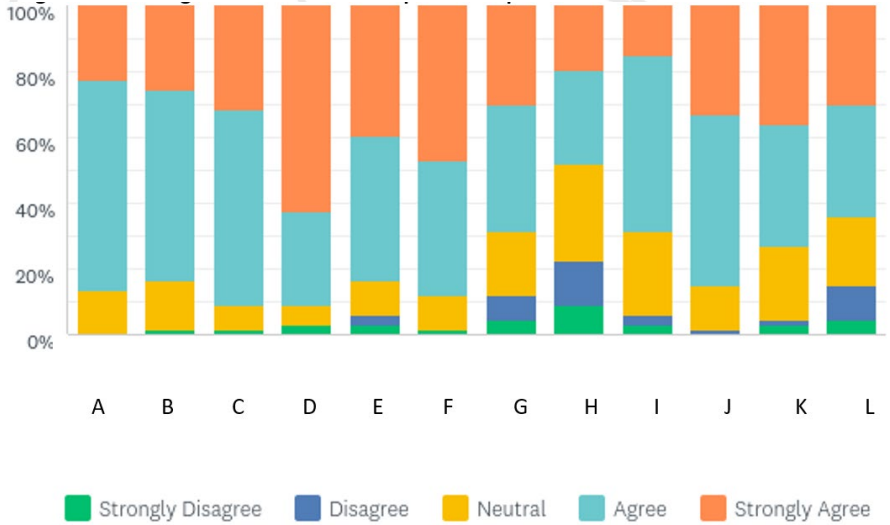
Question 15

In a previous project, the following products or design elements were identified as critical factors in ensuring residential energy efficiency compliance. If they were used as part of an audit system to check that they met design specification and energy rating, what priority level for checking compliance would you assign each element?

Affirmative Observations	‘Correct Windows installed’ and ‘roof insulation well installed’ were the two highest priorities for an audit system. In all categories where ‘correct material’ could be compared with ‘material installed correctly’, it was deemed a higher priority that the material be the correct one
Weighted Average Observations	All above 3.5 Only the three listed below and ‘Hot water system correctly specified’ below 4
Negative Observations	‘Lighting installed as per approved lighting plan’, ‘correct roofing supplied’ and ‘dampers on exhaust fans correctly specified’ had the most responses at moderate priority and below
Recommendations	A phased in approach of mandatory auditing should include correct windows installed and correct roof insulation installed well.

Question 16

The following actions would improve energy efficiency compliance. To what extent do you agree or disagree.



A	Design and product substitution clearly identified	G	Pre-occupancy thermal envelope performance test
B	All specified and installed products are specified fit-for-purpose	H	Post-occupancy (e.g. 12 months) performance measure protocol or tool
C	Clear performance data on products	I	Quality control systems in building product installation
D	'As built' construction is verified against design and rated approval	J	Designers, builders and tradespeople trained in energy efficiency compliance
E	Nationally consistent on-site auditing protocol	K	Energy efficiency compliance identified and costed in all building contracts
F	The energy performance rating is verified against design and as-built, pre-occupancy	L	Accredited energy efficiency performance assessors responsible throughout building process until handover

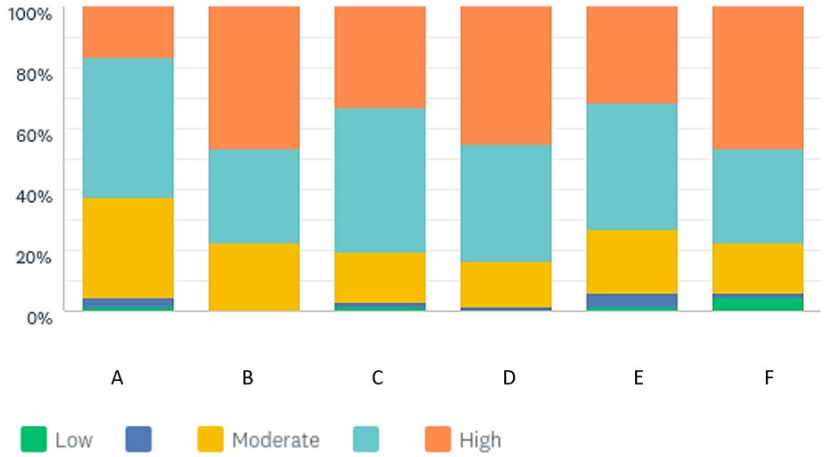
Question 16

The following actions would improve energy efficiency compliance. To what extent do you agree or disagree.

Affirmative Observations	‘Design and product substitution clearly identified’ had no disagreement ‘Design and product substitution clearly identified’ ‘Clear performance data on products’, ‘as-built construction is verified against design and rated approval’, ‘nationally consistent on-site auditing protocol’, ‘Designers, builders and tradespeople trained in energy efficiency’ had more than 85% at least agree ‘As-built construction is verified against design and rated approval’ had the over 60% strongly agreeing that it would improve compliance
Weighted Average Observations	All above 4 bar ‘pre-occupancy thermal envelope test’, ‘post-occupancy performance measure protocol tool’ and ‘Quality control systems in product installation’ ‘Post occupancy thermal envelope test’ was the only one below 3.5
Negative Observations	‘Post-occupancy thermal envelope test’ was the only one to have less than 50% at least agreeing that it would improve energy efficiency compliance, and the most strongly disagreeing
Recommendations	System to verify as built contract QA systems designed and Mandated Industry training needs to be Peer to Peer -people listen to people like themselves System to verify as built construction QA Systems designed and mandated Trade and builder training skills Post occupancy auditing or checking was not seen as important

Question 17

Rate the level of usefulness of the following methods for ensuring design and product substitution is clearly identified during installation



A	Consistent product identification system matched to a national database
B	Products delivered on-site matched to design and specification
C	Variations and substitution identified through audit
D	Verification from a supplier of product's energy efficiency
E	Regulation trigger for suppliers or supplies not meeting standard
F	Pre-occupancy audit

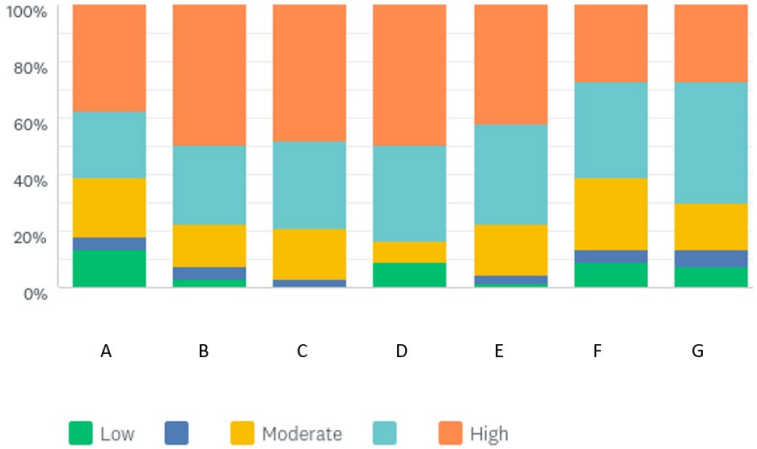
Question 17

Rate the level of usefulness of the following methods for ensuring design and product substitution is clearly identified during installation

Affirmative Observations	'Products delivered on-site matched to design and specification', 'Verification from a supplier of product's energy efficiency' and 'pre-occupancy audit' had the most responses of above moderate usefulness
Weighted Average Observations	All above 3.5 Only 'Consistent product identification system matched to a national database' and 'regulation trigger for suppliers or supplies not meeting standards' below 4
Negative Observations	Least highly rated for usefulness for ensuring product substitution is clearly identified during installation was a 'Consistent product identification system matched to a national database' – it also had the most responses that it would be of moderate or lower usefulness
Recommendations	National data base beneficial if it enables tagging on-site and in real time at design implementation for certifier to check. Can form part of EBP so that it enables low cost audit off site Pre-occupancy audit would be useful

Question 18

Rate the level of usefulness of the following methods for ensuring that the as-built construction is verified against design and rated approval



A	Energy assessors required to review the energy efficiency rating from design through to completion
B	Accredited inspectors required to verify on site installation
C	Regulation to ensure key energy efficiency features shown on drawing before building approval is given
D	Regulation to enforce energy efficiency sign off prior to occupancy
E	The energy performance rating is verified against design and approval
F	Pre-occupancy thermal envelope performance test
G	Pre-occupancy verification checklist developed

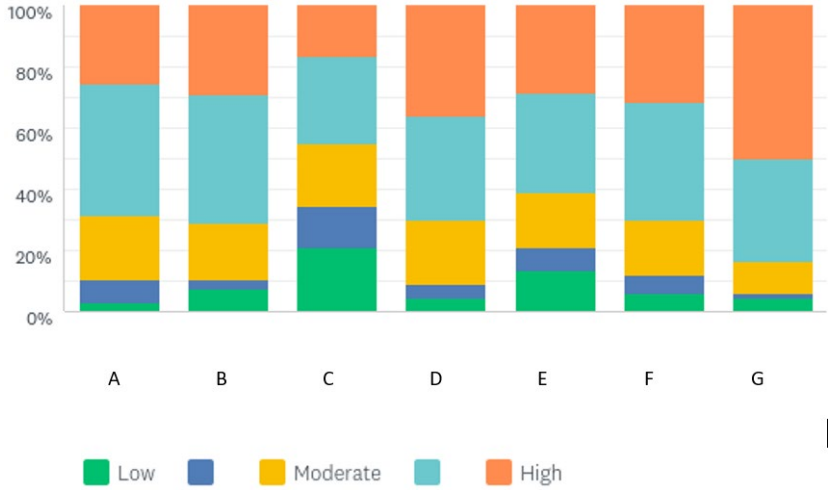
Question 18

Rate the level of usefulness of the following methods for ensuring that the as-built construction is verified against design and rated approval

Affirmative Observations	'The energy performance rating is verified against design and approval' and 'Regulation to ensure key energy efficiency features shown on drawing before building approval is given' had the least responses indicating that they were of below moderate usefulness All had over 50% of responses above moderate usefulness, while 'Accredited inspectors required to verify on site installation', 'Regulation to ensure key energy efficiency features shown on drawing before building approval is given', 'Regulation to enforce energy efficiency sign off prior to occupancy' and 'energy performance rating is verified against design and approval' received 75% of responses above moderate usefulness
Weighted Average Observations	'Energy assessors required to review the energy efficiency rating from design through to completion', 'Pre-occupancy thermal envelope performance test' and 'Pre-occupancy verification checklist developed' were the only ones below 4, none of which had a weighted average below 3.5
Negative Observations	'Energy assessors required to review the energy efficiency rating from design through to completion', 'Pre-occupancy thermal envelope performance test and 'Pre-occupancy verification checklist developed' received the more than 30% of responses indicating moderate usefulness or below. These all had upwards of 5% of their responses indicating that they would be of low usefulness in ensuring verification for this issue, along with 'Regulation to enforce energy efficiency sign off prior to occupancy'
Recommendations	Support the pre-occupancy sign off by an independent accredited person

Question 19

Rate the usefulness of the following methods for ensuring that the energy performance rating is verified pre-occupancy against design and as-built



A	Standard building contracts include clauses for remedial activity if standards aren't met
B	Standard building contracts include penalties if standards aren't met
C	Builders, assessors and designers are liable for houses not meeting performance requirements after 12 months
D	Pre-occupancy energy audits
E	Thermal envelope analytics (e.g. blower door testing, thermal camera etc.)
F	Pre-occupancy verification checklist developed
G	Regulation to enforce energy efficiency sign off prior to occupancy

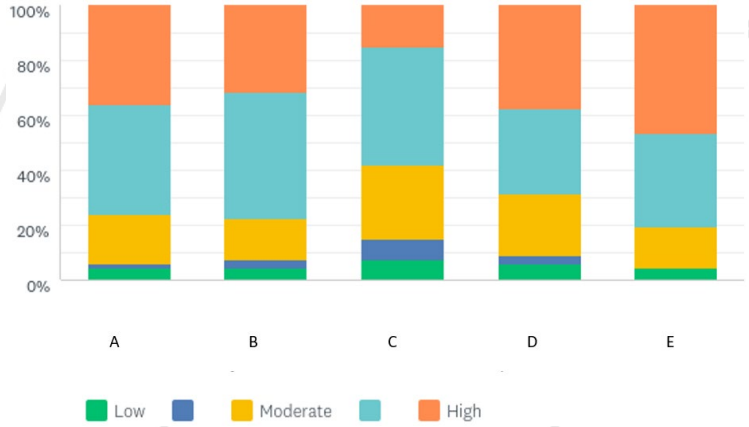
Question 19

Rate the usefulness of the following methods for ensuring that the energy performance rating is verified pre-occupancy against design and as-built

Affirmative Observations	'Regulation to enforce energy efficiency sign off prior to occupancy' was the method which received the most responses rating it above moderate usefulness, and the most rating it of high usefulness for ensuring the energy performance rating is verified against design and as-built
Weighted Average Observations	Only 'Regulation to enforce energy efficiency sign off prior to occupancy' had a WA above 4 And only 'Builders, assessors and designers being liable for houses not meeting performance requirements after 12 months' was below 3.5
Negative Observations	'Builders, assessors and designers are liable for houses not meeting performance requirements after 12 months' had less than 50% of responses indicating it would be an above-moderately useful method for use in this issue 'Builders, assessors and designers are liable for houses not meeting performance requirements after 12 months' and 'thermal envelope analytics' had the most responses indicating low usefulness in this issue
Recommendations	Regulation to enforce pre-audit before occupation or handover Work on liability and thermal testing not supported

Question 20

Rate the level of usefulness of the following elements in creating nationally consistent on-site energy efficiency auditing protocol

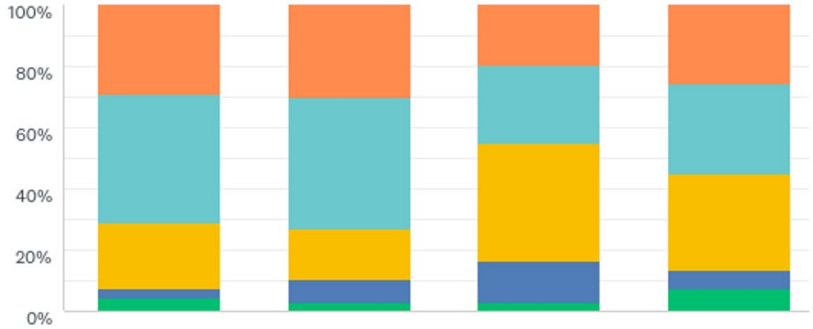


A	Approved audit checklist for each climate-zone
B	Electronic, easy to use, checklist system
C	National database of audits
D	Mandatory random auditing protocol
E	Mandatory certification for auditing

Affirmative Observations	All bar 'National database of audits' had over 65% of responses above moderate usefulness 'Mandatory certification for auditing' had over 45% of responses indicating it would be of high usefulness in this area
Weighted Average Observations	'National database of audits' only one below 3.55 'Mandatory certification for auditing' only one above 4.10 Others lie between 3.91 and 4.01
Negative Observations	'National database of audits' received the most responses stating that it would be of moderate or lower use (over 40%)
Recommendations	Better (well) resourced auditing program Do a national checklist now and widely promote to all players on site Get buy in from all states and industry associations Be clear who is being audited and what for and for what purpose. Work out who does the auditing. Is this a new role?

Question 21

Rate the usefulness of the following quality control systems in building product installation for energy efficiency compliance

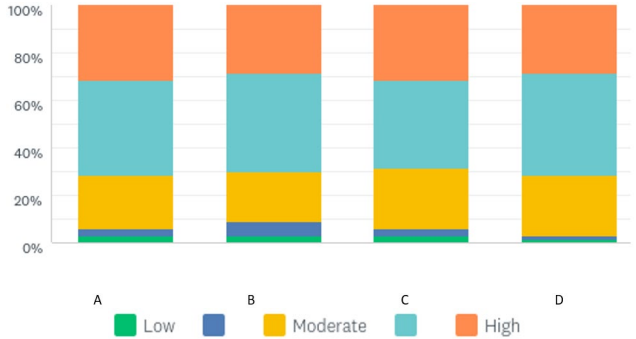


A	Stringent routine product testing and labelling to ensure products are fit-for-purpose
B	Auditing of product installation
C	Electronic photo recognition software for on-site product installations
D	Product installation certified on-site by a Quality Control Supervisor (QCS)

Affirmative Observations	'Stringent routine product testing and labelling to ensure products are fit-for-purpose' and 'Auditing of product installation' both received over 70% of their responses above moderate usefulness
Weighted Average Observations	All had WA below 4 Only 'Electronic photo recognition software for on-site product installations' was below 3.5 'Stringent routine product testing and labelling to ensure products are fit-for-purpose' and 'Auditing of product installation' were both within 0.02 of 3.9
Negative Observations	'Product installation certified on-site by a Quality Control Supervisor (QCS)' had the highest low usefulness response 'Electronic photo recognition software for on-site product installations' had the most responses indicating usefulness below moderate, and moderate and below.
Recommendations	Mandatory verification process for energy efficiency product supplied according to specs meets standards and installed correctly

Question 22

Rate the usefulness of the following methods for training designers, builders and tradespeople in energy efficiency compliance

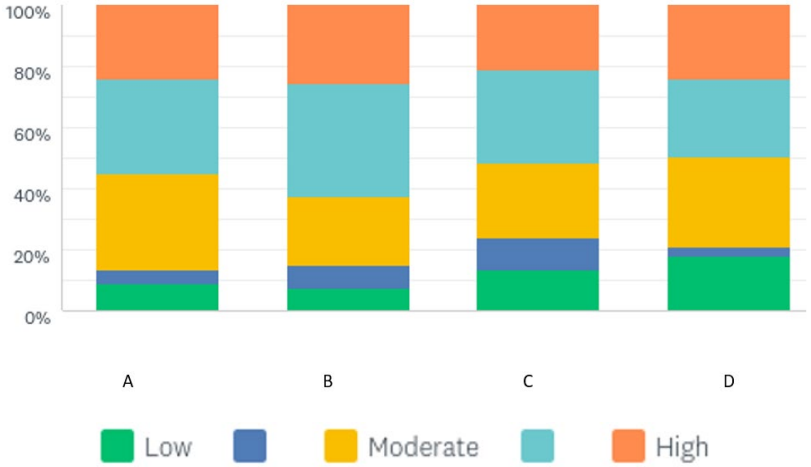


A	Energy efficiency expertise is updated through CPD points for each profession
B	Online training courses for CPD developed per profession
C	On-site training for CPD points on energy efficiency compliance
D	On-site training for CPD points on product knowledge and installation

Affirmative Observations	All methods received over 65% of responses indicating they would be of greater than moderate use for training these people
Weighted Average Observations	All between 3.87 (Online training courses for CPD developed per profession) and 3.96 (On-site training for CPD points on product knowledge and installation) – fairly even
Negative Observations	'Online courses for CPD developed per profession' had the most responses below moderate effectiveness
Recommendations	On-site training for building products and installation and knowledge delivery

Question 23

Rate the usefulness of the following methods for ensuring that energy efficiency compliance is identified and costed in all building contracts



A	Energy efficiency compliance checklist standards and costs available at first planning meeting between owner and designer/builder
B	Standard clause in building contract to include costs of energy efficiency compliance prior to building approval
C	Standard clause in pre-approved bank loans for energy efficiency compliance
D	Standard clause to cover building insurance, and house insurance to comply with energy efficiency requirements

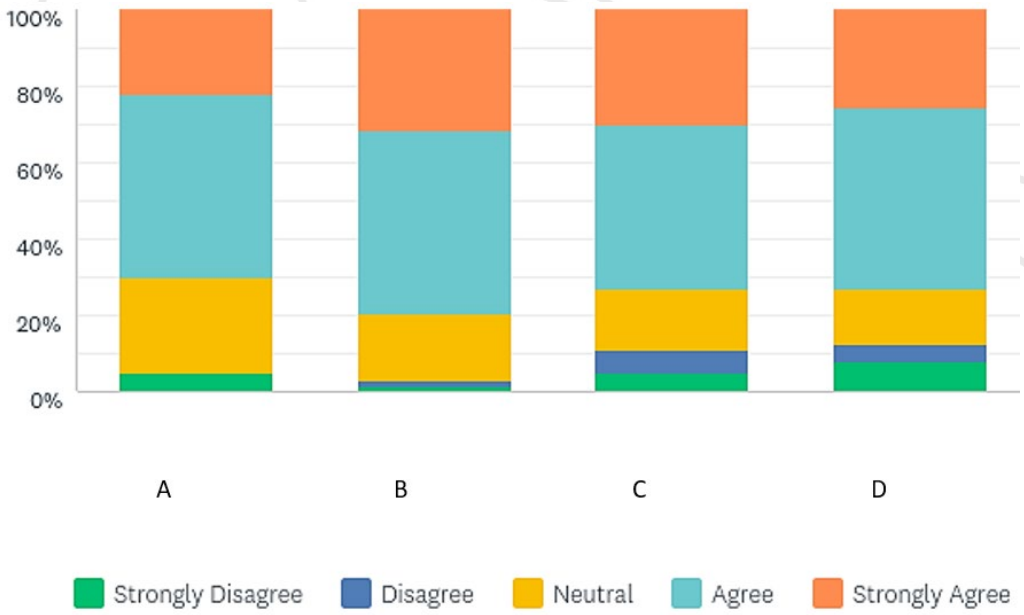
Question 23

Rate the usefulness of the following methods for ensuring that energy efficiency compliance is identified and costed in all building contracts

Affirmative Observations	'Standard clause in building contract to include costs of energy efficiency compliance prior to building approval' had the highest percentage of responses (over 60%) indicating above moderate usefulness in this issue
Weighted Average Observations	'Energy efficiency compliance checklist standards and costs available at first planning meeting between owner and designer/builder' and 'Standard clause in building contract to include costs of energy efficiency compliance prior to building approval' both above 3.5 (by less than 0.2) Other two within 0.01 of 3.35 (Fairly even, but still with two distinct groups)
Negative Observations	'Standard clause to cover building insurance, and house insurance to comply with energy efficiency requirements' and 'Standard clause in pre-approved bank loans for energy efficiency compliance' had the most responses of below moderate usefulness – the former with the most designated as low usefulness (at ~18%)
Recommendations	High % of responses want energy efficiency factored into building contract

Question 24

To what extent do you agree or disagree with the following statements?



A	Compliance checklist should be electronically available and attached to any building contract before approval for commencement of building
B	Compliance checklists should be reviewed prior to handover, verified against design and rating and form part of final approval documentation
C	A NatHERS or alternative certificate should be attached to the building approval prior to site works commencing
D	An Electronic Building Passport available for on-site reference and long-term documentation of energy efficiency information should be mandatory

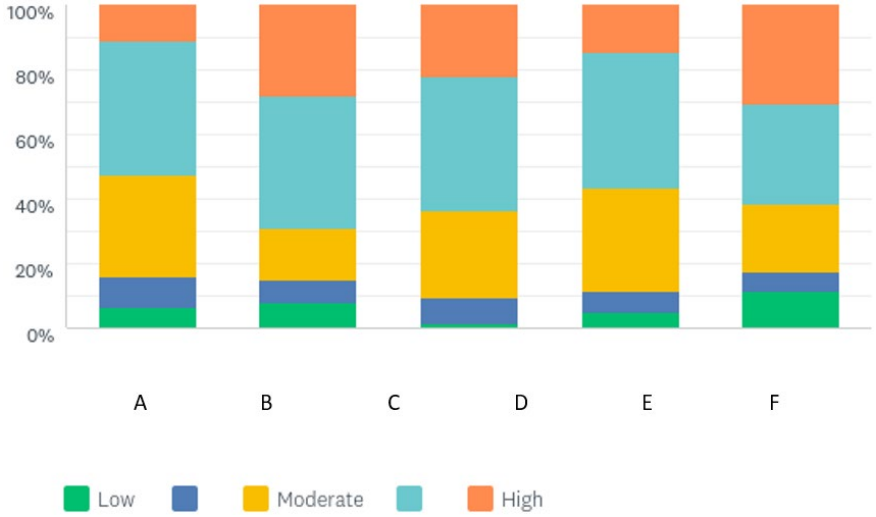
Question 24

To what extent do you agree or disagree with the following statements?

Affirmative Observations	All statements had over 70% of respondents at least agreeing 'Compliance checklists should be reviewed prior to handover, verified against design and rating and form part of final approval documentation' had the most strongly agreeing and least disagreeing (strongly or otherwise)
Weighted Average Observations	'Compliance checklists should be reviewed prior to handover, verified against design and rating and form part of final approval documentation' had the highest WA at 4.06 All other options were above 3.75 – (fairly even)
Negative Observations	The statement 'An Electronic Building Passport available for on-site reference and long-term documentation of energy efficiency information should be mandatory' had the most respondents strongly disagree with it
Recommendations	Checklists and energy ratings certificates (possible electronic) to form part of the building contract and approved documentation Compliance checklists should be available prior to handover

Question 25

How effective would the following systems and tools be for builders to ensure energy efficiency compliance?



A	Electronic Building Passport
B	Building contract has an energy efficiency compliance checklist
C	Verification systems for specified products and their correct installation
D	Energy efficiency compliance toolkit and guideline
E	Contractual obligation between builder and owner for rated energy performance to extend for a nominated period beyond handover
F	Other (please specify)

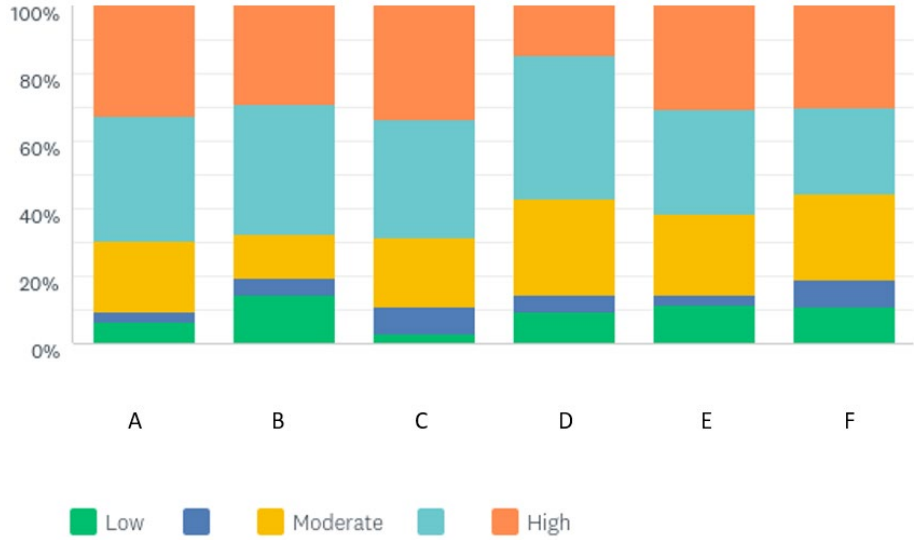
Question 25

How effective would the following systems and tools be for builders to ensure energy efficiency compliance?

Affirmative Observations	'Verification systems for specified products and their correct installation' had the least responses below moderate effectiveness 'Building contract has an energy efficiency compliance checklist' and 'Contractual obligation between builder and owner for rated energy performance to extend for a nominated period beyond handover' were seen as the most highly effective
Weighted Average Observations	'Building contract has an energy efficiency compliance checklist' and 'Verification systems for specified products and their correct installation' had the highest WA which were within 0.01 of 3.75 'Electronic building passport' was the only one below 3.5
Negative Observations	'Contractual obligation between builder and owner for rated energy performance to extend for a nominated period beyond handover' returned the most responses indicating that it would have a low effect in ensuring energy efficiency compliance
Recommendations	Energy efficiency Checklist in contract documents Energy efficiency checklist as part of contract is strongly supported, Not to tie builder into post occupancy performance as deemed unfair Verification system for specified products to be developed which could be part of an electronic system

Question 26

How effective would the following tools be for regulators to ensure energy efficiency compliance?



A	Electronic Building Passport
B	Building contract has an energy efficiency compliance checklist
C	Verification systems for specified products and their correct installation
D	Energy efficiency compliance toolkit and guideline
E	Contractual obligation between builder and owner for rated energy performance to extend for a nominated period beyond handover
F	Other (please specify)

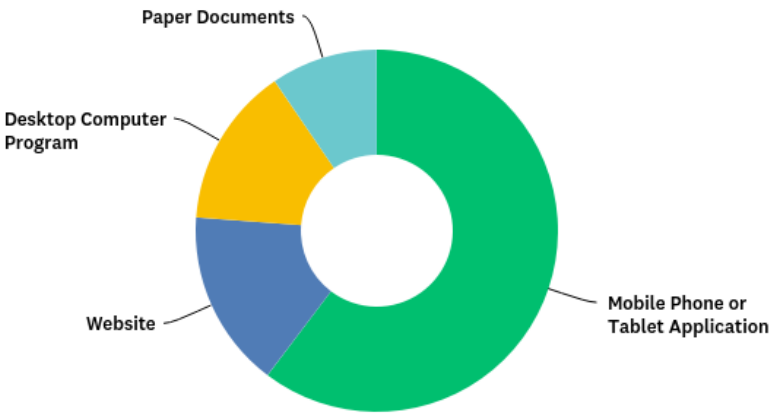
Question 26

How effective would the following tools be for regulators to ensure energy efficiency compliance?

Affirmative Observations	All bar 'Energy efficiency compliance toolkit and guideline' were considered highly effective by at least 29% of respondents 'Electronic building passport', 'Building contract has an energy efficiency compliance checklist' and 'Verification systems for specified products and their correct installation' were all considered more than moderately effective by over 65% of respondents 'Verification systems for specified products and their correct installation' was considered to be of low effectiveness by the least number of respondents
Weighted Average Observations	'Energy efficiency compliance checklist' was the only tool given a WA below 3.5 'EBP' and 'Verification systems for specified products and their correct installation' were the two highest (both within 0.02 of 3.85)
Negative Observations	'Building contract has an energy efficiency compliance checklist' had the highest number of responses indicating it was of low effectiveness All bar 'EBP' and 'Verification systems for specified products and their correct installation' had over 10% of respondents say that they would be low on the effectiveness scale for this issue 'Energy efficiency compliance toolkit and guideline' had the lowest number of 'high effectiveness' responses
Recommendations	Ensure transparency in any strategies undertaken EBP which includes verification system for products and installations should be further investigated and part of a phased in approach

Question 27

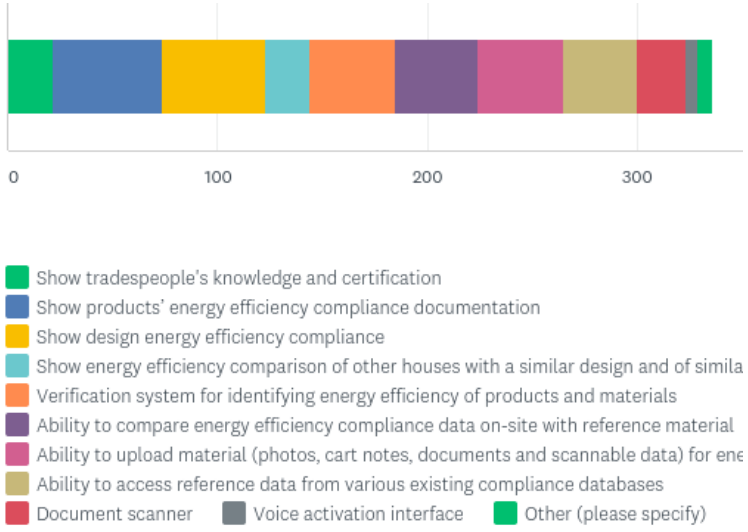
What technology would you want a compliance tool to use (e.g. EBP, Compliance Checklist, product register, photographic evidence) to make it as effective as possible? (Select one only)



Affirmative Observations	'Mobile phone or tablet application' had over 60% of responses
Interesting Observations	'Website' and 'Desktop computer program' both had approximately 15% of responses each which is only 6% higher than for 'Paper documents' (which had 9%)
Negative Observations	Paper had the least responses
Recommendations	Develop standard data collect checklist available to all home inspections via internet available through tablet or smart phone app Make all (data) available via onsite based app or software Must cover design, construct, as built, - (must) integrate across whole cycle Integrate assessment with post approval checks to recalculate (energy efficiency) on site as current state of energy efficiency compliance

Question 28

Which of the following functions would you want an EBP to have, if one were to be created? (Select all that apply)

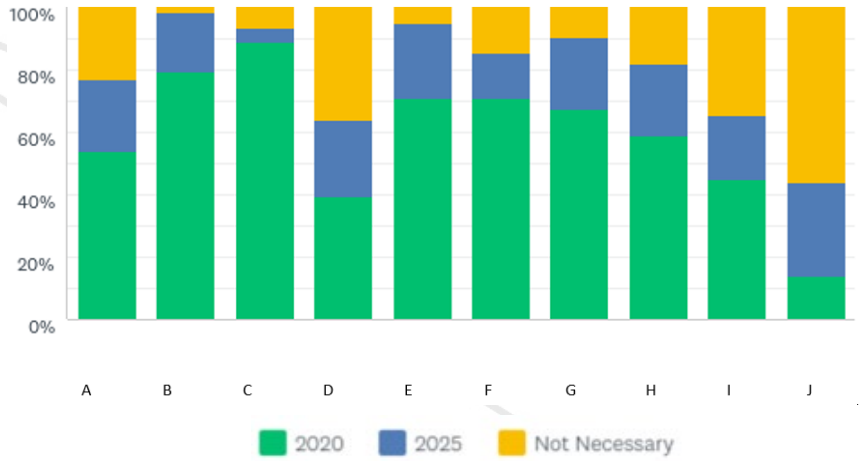


Affirmative Observations	Top two responses were 'show product's energy efficiency compliance documentation' and 'Show design energy efficiency compliance' with over 75% of respondents indicating that they would want an EBP to have them Next highest grouping is 'verification system for identifying energy efficiency of products and materials', 'ability to compare energy efficiency compliance data on-site with reference material', 'ability to upload material for energy efficiency compliance…' and 'ability to access reference data from … existing databases' which all received between 55-65% of respondents' approval
Interesting Observations	11% had an 'other' response – check Options not mentioned above or below had around 35% of respondents wanting them
Negative Observations	'Voice activation' had by far the least amount of responses
Recommendations	Develop EBP with all required functions and Include in EBP Upload of materials documents, specs and design Tagging systems of materials so know what has been supplied to tie into multiple checkpoints Product and material verification system

Question 29

If an EBP was to be created, by which year do you believe the following elements should be implemented?

A	Show tradespeople's knowledge and certification	F	Ability to compare energy efficiency compliance data on-site with reference material
B	Show products' energy efficiency compliance documentation	G	Ability to upload material (photos, cart notes, documents and scannable data) for energy efficiency compliance into a national database system on-site or remotely
C	Show design energy efficiency compliance	H	Ability to access reference data from various existing compliance databases
D	Show energy efficiency comparison of other houses with a similar design and of similar size and climate-zone location	I	Document scanner
E	Verification system for identifying energy efficiency of products and materials	J	Voice activation interface



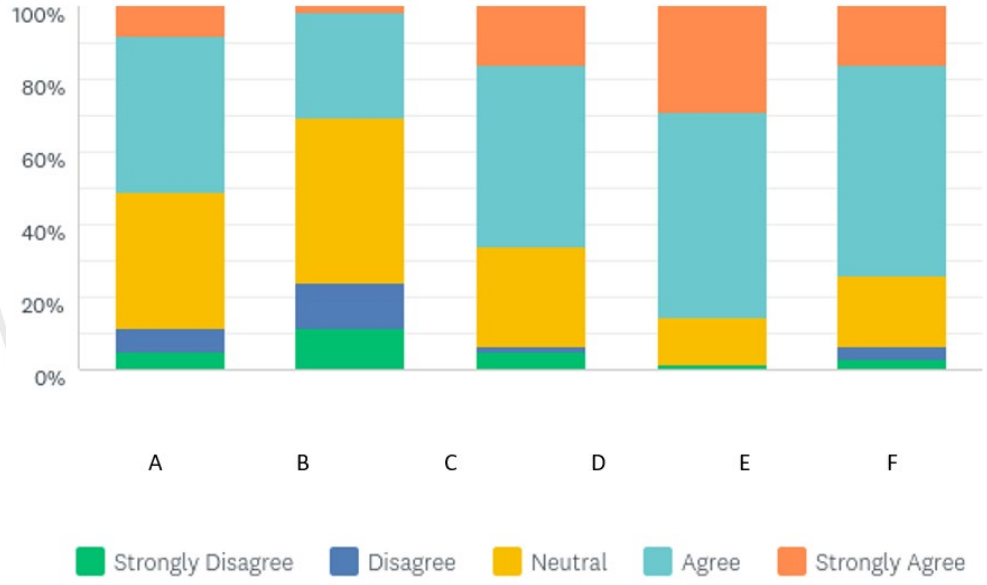
Question 29

If an EBP was to be created, by which year do you believe the following elements should be implemented?

Observations for 2020	‘Show design energy efficiency compliance’ had over 85% of responses stating it should be implemented by 2020 Closely followed by ‘Show product’s energy efficiency compliance documentation’ with ~80% ‘Document scanner’, ‘voice activation interface’ and ‘show energy efficiency comparison of other houses with a similar design, size and climate-zone location’ were viewed as the least necessary to be implemented by 2020
Observations for 2025	Two lowest elements to be implemented by this year both had over 70% of their responses in the 2020 category Only ‘Voice activation interface’ had more than 25% of its responses stating it should be implemented by 2025 This basically means that for the necessary elements, if it hasn’t been done by 2020, it should then be done in 2025
Observations on necessity	‘Voice activation interface’ had by far the most amount of responses (over 50%) indicating that it is not necessary, followed by ‘Document scanner’ and ‘show energy efficiency comparison of other houses with a similar design, size and climate-zone location’ ‘Show product’s energy efficiency compliance documentation’, ‘show design energy efficiency compliance’ and ‘verification system for identifying energy efficiency products and materials’ were deemed the least unnecessary
Interesting observations?	Based on the above: • Top three priorities are: ‘Show product’s energy efficiency compliance documentation’, followed by ‘show design energy efficiency compliance’ and ‘verification system for identifying energy efficiency products and materials’ • Lowest three priorities are ‘voice activation interface’, ‘document scanner’ and ‘show energy efficiency comparison of other houses with a similar design, size and climate-zone location’
Recommendations	• An EBP should include the following elements that support compliance with energy efficiency ○ product’s energy efficiency compliance documentation, followed by ○ show design energy efficiency compliance and ○ verification system for identifying energy efficiency products and materials

Question 30

To what extent do you agree or disagree that the following elements should be implemented as part of an EBP or other compliance guideline/toolkit?



A	Real time online technical help service
B	Community peer help service
C	GPS locator and climate-zone lookup for requirements for energy efficiency compliance
D	Product and specification database
E	Easy access trade specification data and video instruction for installation
F	Other (please specify)

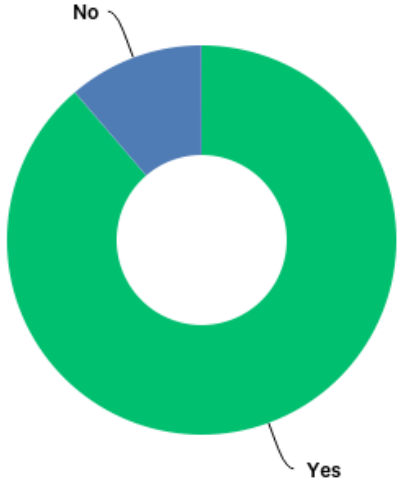
Question 30

To what extent do you agree or disagree that the following elements should be implemented as part of an EBP or other compliance guideline/toolkit?

Affirmative Observations	Over 80% at least agreed that a ‘product and specification database’ should be a part of a compliance guideline/toolkit or EBP – This element also had the highest response of ‘strongly agree’ of all the options and the lowest disagree (strongly included) response. Over 65% at least agreed that a ‘GPS locator and climate-zone lookup for requirements for energy efficiency compliance function and ‘Easy access trade specification data and video instruction for installation’ should be implemented in the desired tool/system
Weighted Average Observations	‘Community peer help service’ had the lowest WA which was below 3 ‘Product and specification database’ had the highest WA with 4.11 ‘Real time online technical help service’ was the only remaining element to have a WA below 3.5 This clearly shows that the positive and negative observations are strong
Negative Observations	‘Community peer help service’ had the lowest responses of strong agreement and agreement, and the highest responses of disagreement and strong disagreement
Recommendations	Need a national data base of products and specification data base and substitution products for easy look up on site as part of EBP Energy efficiency compliance requirement look up based on climate zone

Question 31

Greater regulation of energy efficiency compliance would help to provide a constructive environment for industry and compliance assessors to work together on improving energy efficiency compliance for new houses.” Do you personally agree with this statement?

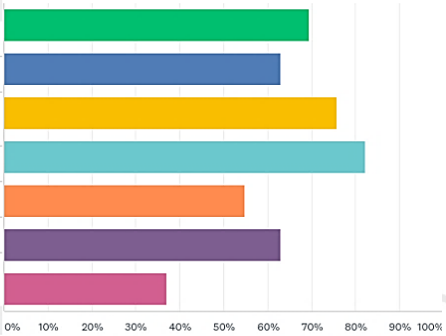


Affirmative Observations	‘Yes’ was the winner by far
Interesting Observations	Majority are on board with extra regulation – this should inform the rest of the answers to this section
Recommendations	There should be greater regulations for energy efficiency compliance for new houses Regulation may assist the industry to integrate and pull together to deliver energy efficiency compliance

Question 32

Which of the following regulatory actions would effectively assist in energy efficiency compliance? (Select all that apply)

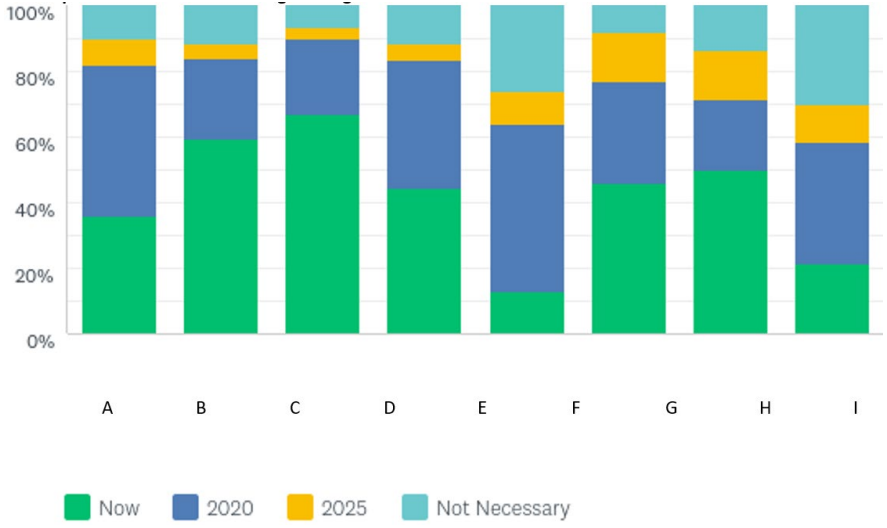
ANSWER CHOICES	RESPONSES	
Mandating energy efficiency audits	69.35%	43
Energy efficiency compliance referenced in a standard building contract	62.90%	39
Energy efficiency requirements explicitly outlined on plans submitted for building approval	75.81%	47
Energy efficiency certification must be checked and provided prior to handover	82.26%	51
Verification system for compliance of local and imported products and materials	54.84%	34
Spot auditing system	62.90%	39
Where finance is required, finance institutions requiring energy efficiency compliance as part of loan application approval	37.10%	23
Total Respondents: 62		



Affirmative Observations	Energy efficiency: ‘certification being checked and provided prior to handover’ and ‘Energy efficiency requirements explicitly outlined on plans submitted for building approval’, both received over 75% of responses
Interesting Observations	The three parts of enhancing compliance seemed critical through the whole process of design, during construction and at completion were the three highest scores.
Negative Observations	“Only” 37% said that ‘Where finance is required, finance institutions requiring energy efficiency compliance as part of loan application approval’ would be effective – the lowest of all options
Recommendations	Energy efficiency explicitly outlined on plans prior to building contract approval Energy efficiency certification checked and provide prior to handover Role of the financial institutions approval for loans and legal liabilities need further discussion and input and consensus about their role in energy efficiency compliance if at all

Question 33

If recommended and if agreed, by which year do you believe the following regulations should be implemented?



A	Mandating energy efficiency audits during the building cycle	F	Verification system for compliance of local and imported products and materials
B	Energy efficiency compliance referenced in a standard building contract	G	Spot auditing system
C	Energy efficiency requirements explicitly outlined on plans submitted for building approval	H	Where finance is required, finance institutions requiring energy efficiency compliance as part of loan application approval
D	Pre-occupancy energy efficiency rating verified	I	Other regulation (please specify regulation and a year)
E	Post-occupancy follow-up at a nominated period beyond handover		

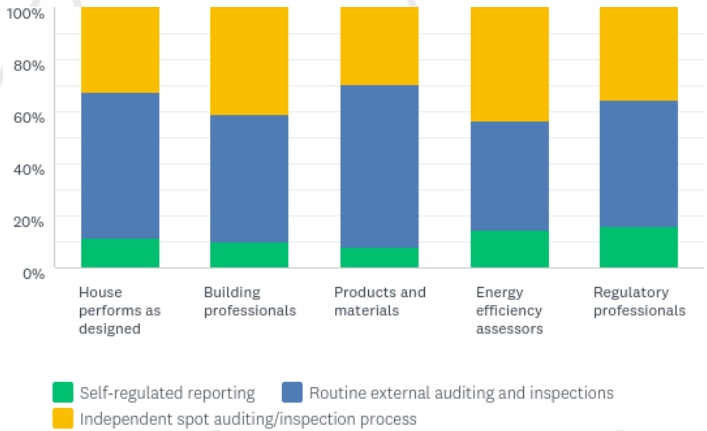
Question 33

If recommended and if agreed, by which year do you believe the following regulations should be implemented?

Observations for Now	‘Energy efficiency requirements explicitly outlined on plans submitted for building approval’ is a high priority given 67% of respondents said it should be implemented now Next most prevalent is ‘energy efficiency compliance referenced in a standard building contract’ with 59% of respondents putting it in this timeframe ‘Post-occupancy follow-up at a nominated period beyond handover’ is the lowest priority for right now (only 13% of responses in this timeframe), followed by ‘Where finance is required, finance institutions requiring energy efficiency compliance as part of loan application approval’ The remaining 3 ranged between 36% approval for immediate implementation (Mandating energy efficiency audits during the building cycle) and around 48% for the other two
Observations for 2020	‘Post-occupancy follow-up at a nominated period beyond handover’ had the highest (50%) percentage of responses for action by 2020, likely due to its very low ‘immediate action’ response count First four options had at least 80% of their responses for 2020 or earlier
Observations for 2025	Of the last four options, ‘Verification system for compliance of local and imported products and materials’ and ‘spot auditing system’ had the largest percentages of responses for implementation by this time
Observations on Necessity	‘Energy efficiency requirements explicitly outlined on plans submitted for building approval’ had the least number of ‘Not necessary’ responses ‘Post-occupancy follow-up’ and ‘Where finance is required, finance institutions requiring energy efficiency compliance as part of loan application approval’ had the highest number of ‘Not necessary’ responses – so they are clearly the lowest priorities
Recommendations	Energy efficiency requirements outlined on plans … for building approval’ NOW Energy efficiency compliance referenced in a standard building contract’ NOW ‘Mandating energy efficiency audits during the building cycle’ and ‘Pre-occupancy energy efficiency rating verified’: 2020 or earlier

Question 34

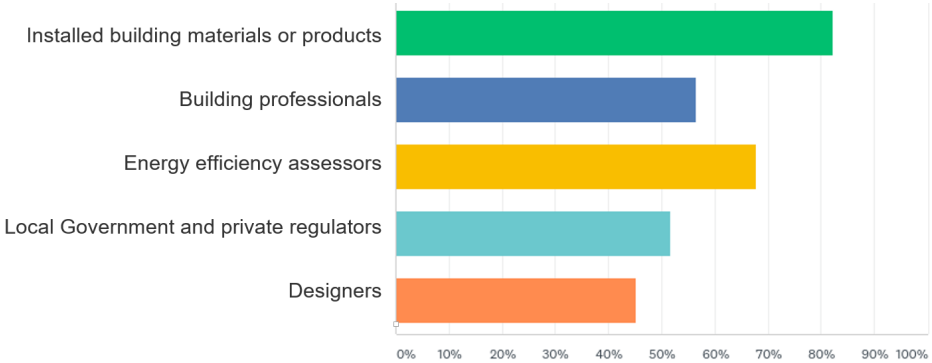
Which of the following auditing approaches do you believe would best serve energy efficiency compliance across the following areas?



Affirmative Observations	For all the given areas 'Routine external auditing and inspections' took over 40% of responses The only case where this was not the most popular approach was for 'Energy efficiency assessors' who had 2% more responses for 'Independent spot auditing/inspection process' Other than the aforementioned area, 'Independent spot auditing/inspection process' received between 32% to 41% of the responses
Interesting Observations	Regulatory professionals had the highest responses in the 'self-regulated reporting' category – understanding why that is needs further investigation
Negative Observations	Based on these responses 'Self-regulated reporting' is 2-4 times less likely to best serve these auditing areas than the next nearest approach – so it is not widely viewed by regulators as an effective approach
Recommendations	Mandated by regulation/ legislation Audit individual doing energy assessment (using all compliance methods) Legislate for as built mandatory inspection e.g. California Systems to verify product specifications as built Self-regulation reporting not seen as effective

Question 35

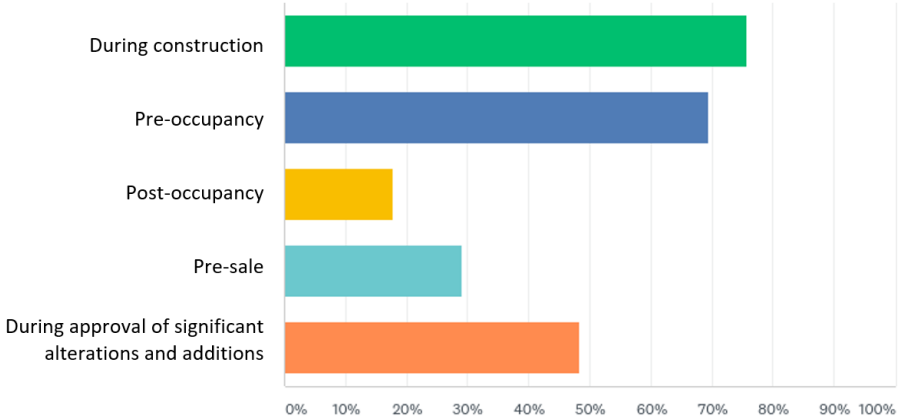
Which of the following do you believe should have routine energy efficiency compliance audits? (Select all that apply)



Affirmative Observations	'Installed building materials or products' and 'energy efficiency assessors' both had over 65% of responses indicating they should have routine audits
Interesting Observations	Interesting that assessors needed auditing more than building professionals
Negative Observations	The lowest number of responses belonged to 'designers' who were the only audit candidates to receive less than 50% of responses in favour of routine audits
Recommendations	Regular auditing and program for all stakeholders First 2 areas for auditing should include • energy efficiency assessors • Installed building products and materials

Question 36

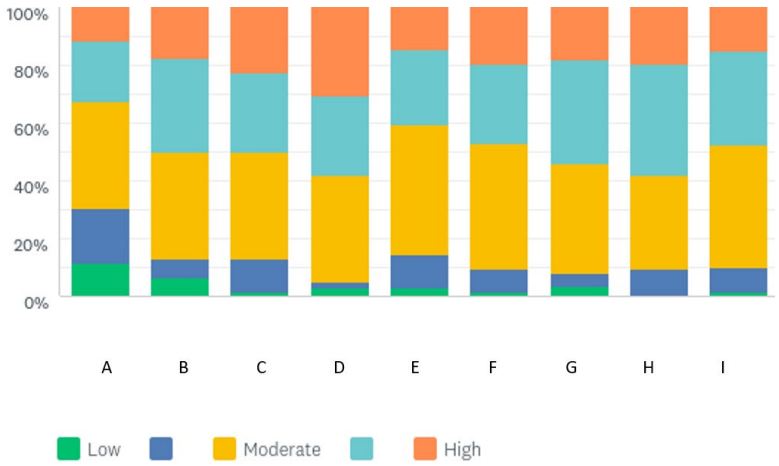
If guidelines or regulations were introduced for routine auditing for energy efficiency compliance for houses, when should they occur? (Select all relevant)



Affirmative Observations	'During construction' and 'pre-occupancy' were most selected
Interesting Observations	Strong support for auditing during construction and pre-occupancy.
Negative Observations	'Post-occupancy' and 'pre-sale' were viewed as the worst times for routine audits
Recommendations	Post occupancy follow up over years Audits should occur during construction and at pre-occupancy

Question 37

As a regulator please rate the level of usefulness of the following actions in achieving energy efficiency standards?



A	Increased auditing of designers	**F**	Increased transparency of designers and specifiers of products and systems, through access to verified compliance data
B	Increased auditing of building industry and tradespeople	**G**	Increased transparency of building industry and tradespeople through access to verified compliance data
C	Increased auditing of energy efficiency assessors	**H**	Increased transparency of data associated with energy efficiency assessors (such as skills, experience, CPD points)
D	Increased auditing of products and materials	**I**	Increased transparency of regulators' decision making
E	Increased auditing of regulators	**J**	Other (please specify)

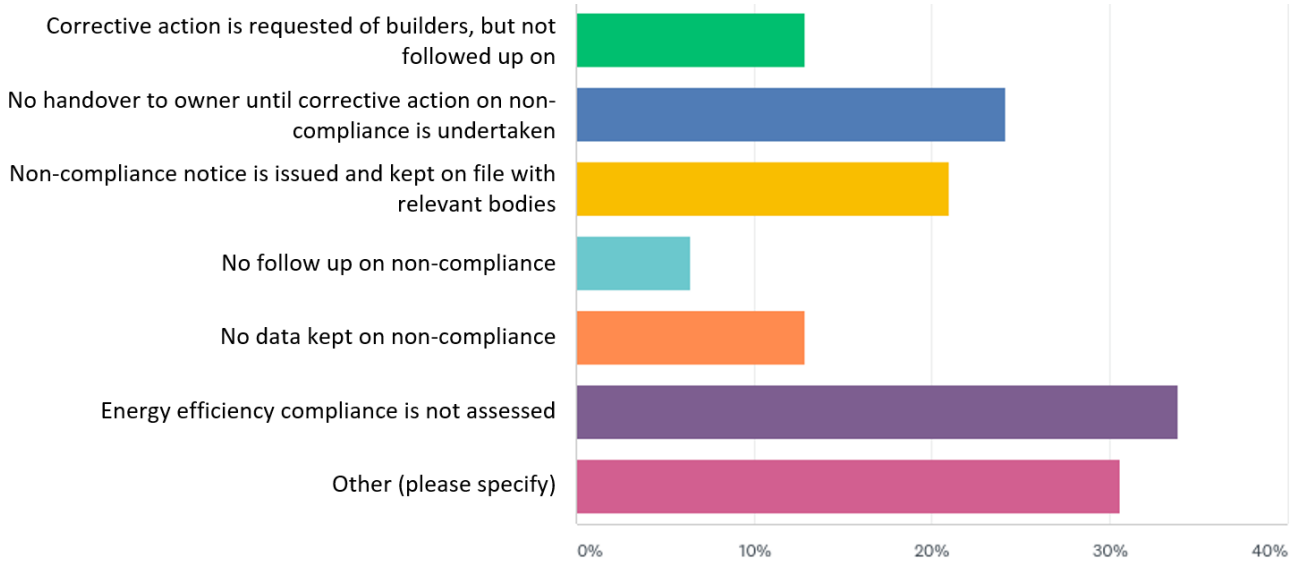
Question 37

As a regulator please rate the level of usefulness of the following actions in achieving energy efficiency standards?

Affirmative Observations	'Increased auditing of products and materials' had the most responses indicating that it was of high usefulness in this issue, and lowest responses indicating less than moderate use
Weighted average Observations	'Increased auditing of designers' had the lowest WA (3.02) Highest three were 'Increased auditing of products and materials', 'Increased transparency of building industry and tradespeople through access to verified compliance data', and 'Increased transparency of data associated with energy efficiency assessors (such as skills, experience, CPD points)' all above 3.6
Negative Observations	'Increased auditing of designers' had the highest number of responses indicating less than moderate and low usefulness in achieving energy efficiency standards, and least amount indicating above moderate and high usefulness
Recommendations	Over 80% (moderate to high) viewed auditing of tradesperson as justified and supported Increasing transparency of work done by industry needs further unpacking to understand what this means and how this could be achieved

Question 38

How do you currently manage energy efficiency non-compliance? (Select all that apply)



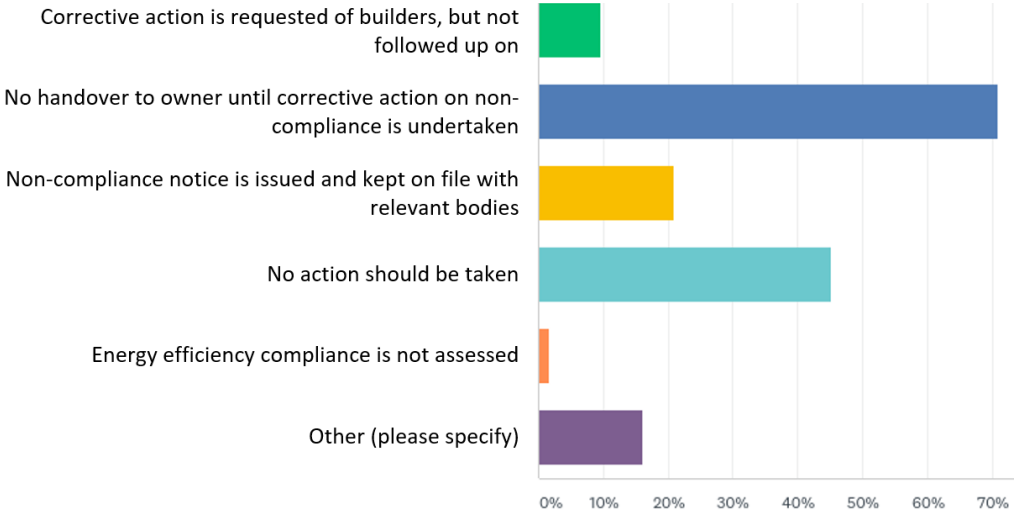
Question 38

How do you currently manage energy efficiency non-compliance? (Select all that apply)

Affirmative Observations	'No follow up on non-compliance' is quite low
Interesting Observations	High 'Other' – check responses
Negative Observations	'Energy efficiency compliance is not assessed' is highest! Further research and work may be required to understand why this is the case
Recommendations	Opportunity to provide guidance on how to deal with non-compliance Introduce strategies to identify non-compliance early Get people talking about compliance Make repercussions of non-compliance meaningful i.e. no occupancy permit Development of a non-compliance approach as a national system

Question 39

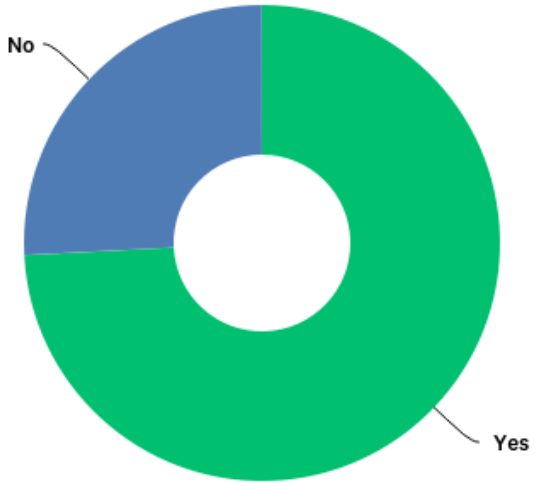
Assuming energy efficiency compliance is checked, what action(s) should be taken to address non-compliance? (Select all that apply)



Affirmative Observations	'No handover to owner until corrective action on non-compliance is undertaken' is highest Low responses for 'No action should be taken' and 'corrective action requested of builders, but not followed up on'
Recommendations	Inspect prior – suggest pre-plaster In developing a potential national non-compliance response system consideration should be given to pre-handover checklists and no handover until compliance is reached

Question 40

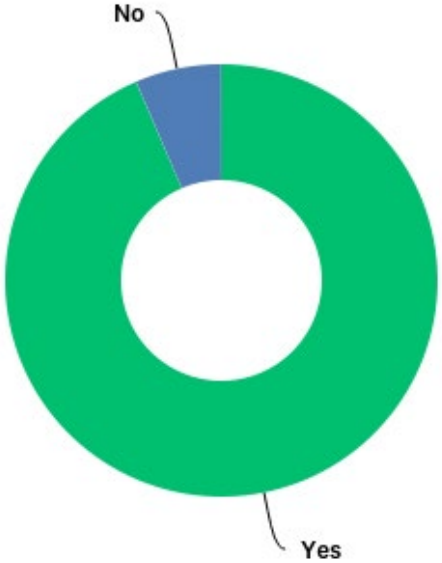
Do we need independent assessment of energy efficiency compliance from the design phase through to the handover phase?



Affirmative Observations	~75% say yes
Negative Observations	~25% say no
Recommendations PD/JD	Develop a national independent assessment system and accreditation system of energy efficiency compliance

Question 42

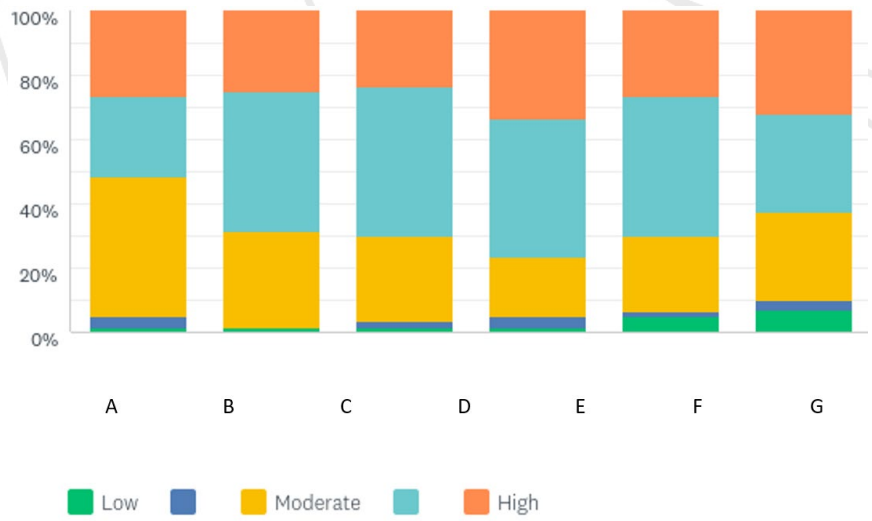
Is there a role for nationally consistent guidelines governing energy efficiency?



Affirmative Observations	~94% say yes
Recommendations	Develop national consistent guidelines for energy efficiency

Question 43

Rate the usefulness of the following education and training methods for improving energy efficiency compliance standards



A	Increased education for designers and building industry through mandatory course requirements	**E**	CPD energy efficiency training/accreditation for regulatory professionals
B	Increased education for energy efficiency assessors through continuous improvement requirements	**F**	The establishment of an accredited profession for energy efficiency compliance officers
C	CPD energy efficiency training/accreditation for designers and building industry	**G**	Other (please specify)
D	CPD energy efficiency training/accreditation for energy efficiency assessors		

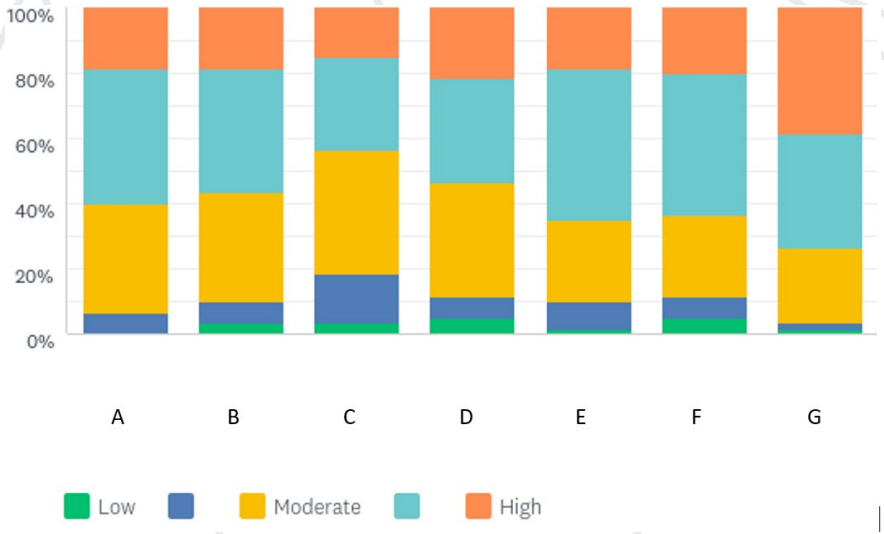
Question 43

Rate the usefulness of the following education and training methods for improving energy efficiency compliance standards

Affirmative Observations	The three 'CPD training/accreditation' options for different professions were rated higher than the corresponding alternatives of 'mandatory course requirements' and 'continuous improvement requirements' – thus the data shows that 'CPD training/accreditation' options are the most useful training methods
Weighted Average Observations	'CPD training/accreditation for energy efficiency assessors' rated highest (4.03) – possibly further indication of a bias towards more regulations around energy efficiency assessors All WA's between 3.75 and 4.05 – fairly even
Negative Observations	'CPD energy efficiency training/accreditation for regulatory professionals' and 'establishment of accredited profession for energy efficiency compliance officers' had the most 'low' responses – (only in the order of 5-7% of responses)
Recommendations	Ensure all training and development contributes to CPD points training and accreditation regimes within professions

Question 44

How effective do you believe the following training methods would be for regulators (including planners, assessors, building surveyors, inspectors and associated officials)?



A	Regular CPD updating on NCC and energy provisions	E	Face to face workshops to refresh knowledge on energy efficiency requirements in the NCC
B	Online webinars on energy efficiency requirements in the NCC	F	On-site training for regulators on energy efficiency requirements in the NCC
C	Refresher mobile training app specific to Section J of the NCC	G	Consistent national guidelines for implementing energy efficiency requirements in the NCC
D	Mandatory 1-day course on energy efficiency requirements in the NCC		

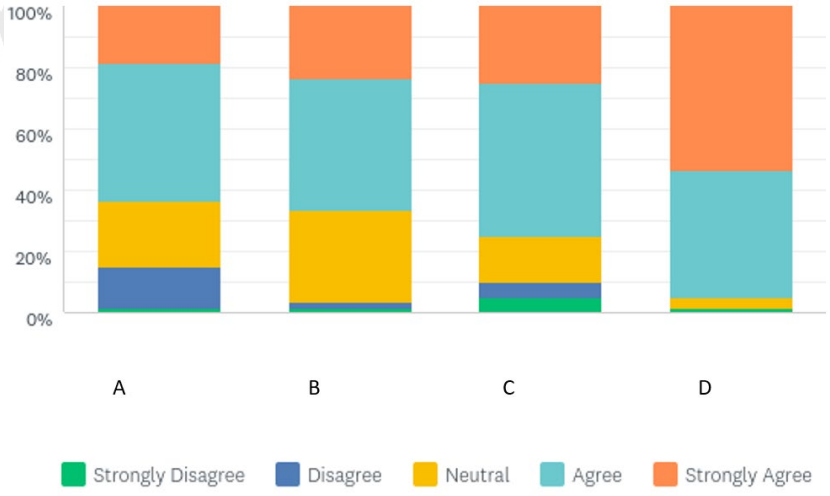
Question 44

How effective do you believe the following training methods would be for regulators (including planners, assessors, building surveyors, inspectors and associated officials)?

Affirmative Observations	'Consistent national guidelines for implementing energy efficiency requirements in the NCC' had the least responses indicating they would be less than moderately effective and highest amount of responses indicating they would be highly effective
Weighted average Observations	'Consistent national guidelines for implementing energy efficiency requirements in the NCC' only one above 4 'Refresher mobile training app specific to Section J of the NCC' only one below 3.5 All others in below 3.75
Negative Observations	'Refresher mobile training app specific to Section J of the NCC' had the most responses indicating they would be less than moderately effective and least amount of responses indicating they would be highly effective
Recommendations	Develop consistent national guidelines that can be used as training guides for CPD points for all parts of the design development and approval and assessment professions for class one houses

Question 45

To what extent do you agree with the following statements for energy efficiency compliance officers?



A	Energy efficiency compliance officers should have a tertiary education (TAFE or University)
B	Energy efficiency compliance officers should have a professional association
C	Energy efficiency compliance officers should have CPD points
D	Energy efficiency compliance officers should have knowledge and understanding of products, product technology and building systems

Question 45

To what extent do you agree with the following statements for energy efficiency compliance officers?

Affirmative Observations	‘Energy efficiency compliance officers should have knowledge and understanding of products, product technology and building systems’ had 95% agreement (53% strong) ‘Energy efficiency compliance officers should have a professional association’ had less than 4% disagreeing (strongly or otherwise)
Weighted average Observations	‘Energy efficiency compliance officers should have knowledge and understanding of products, product technology and building systems’ had the highest with 4.45 ‘Energy efficiency compliance officers should have a tertiary education’ had the lowest with 3.65 Others only 0.2 above that – fairly even aside from highest
Negative Observations	No real low ones… ‘Energy efficiency compliance officers should have a tertiary education’ had highest disagreement – but is that really much of a negative?
Recommendations	Develop a national system for education and training that covers knowledge and understanding of products, product technology and building systems for energy efficiency compliance