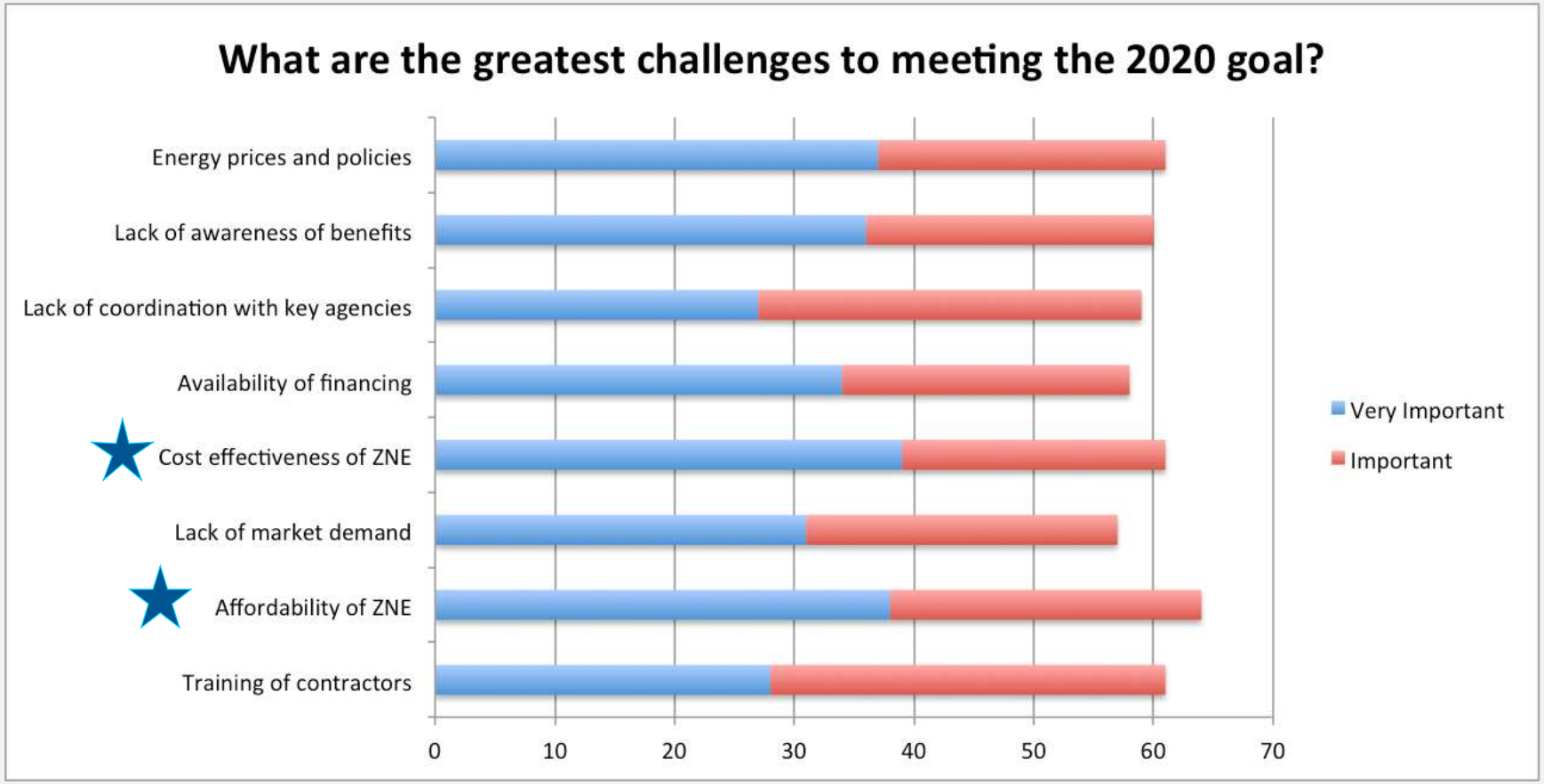
Residential Construction Low Carbon Homes

Industry Survey Findings | June 22, 2020

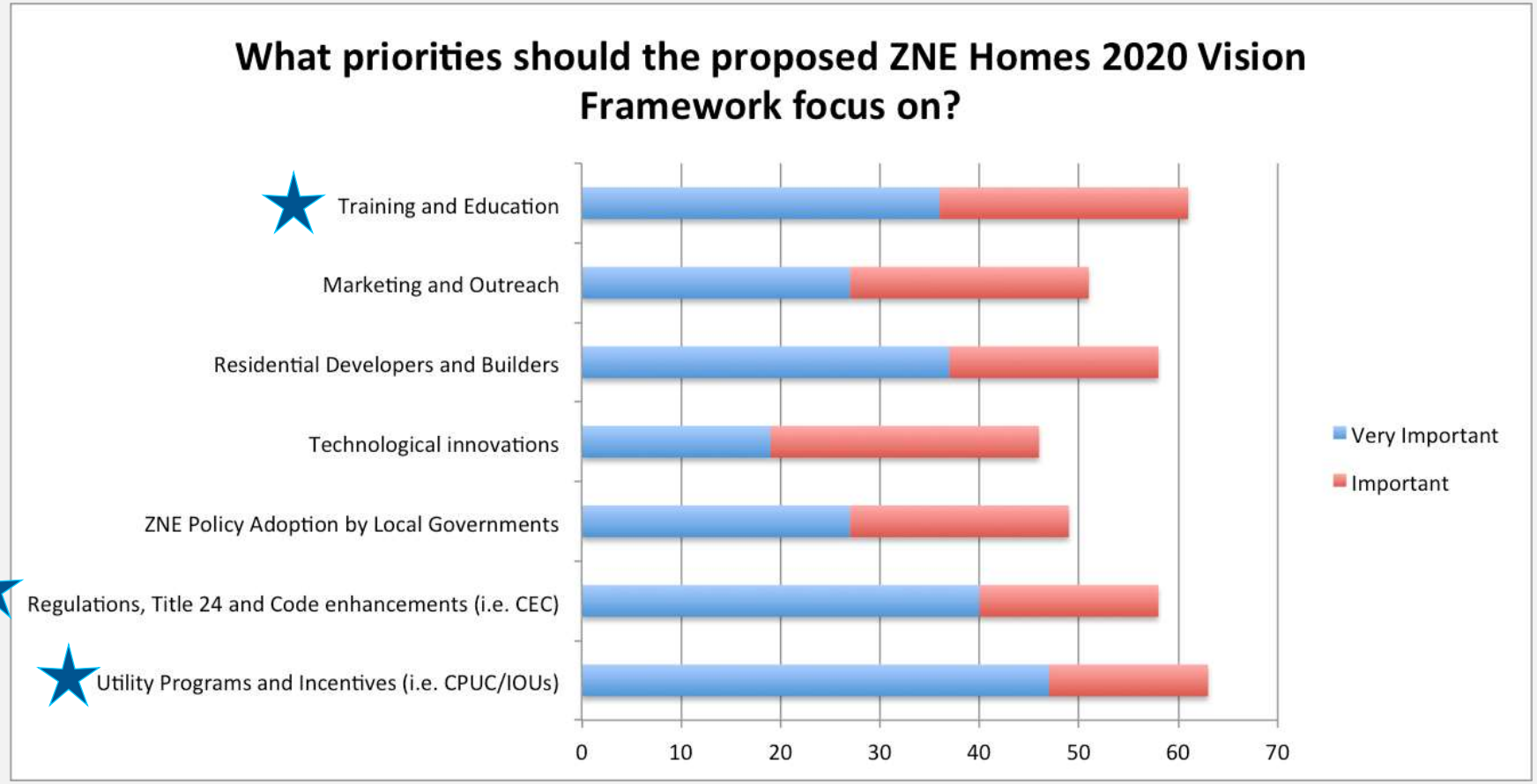
Flash Back 2013

ZNE Greatest Challenges. . .



Flash Back 2013

ZNE New Residential Priorities. . .

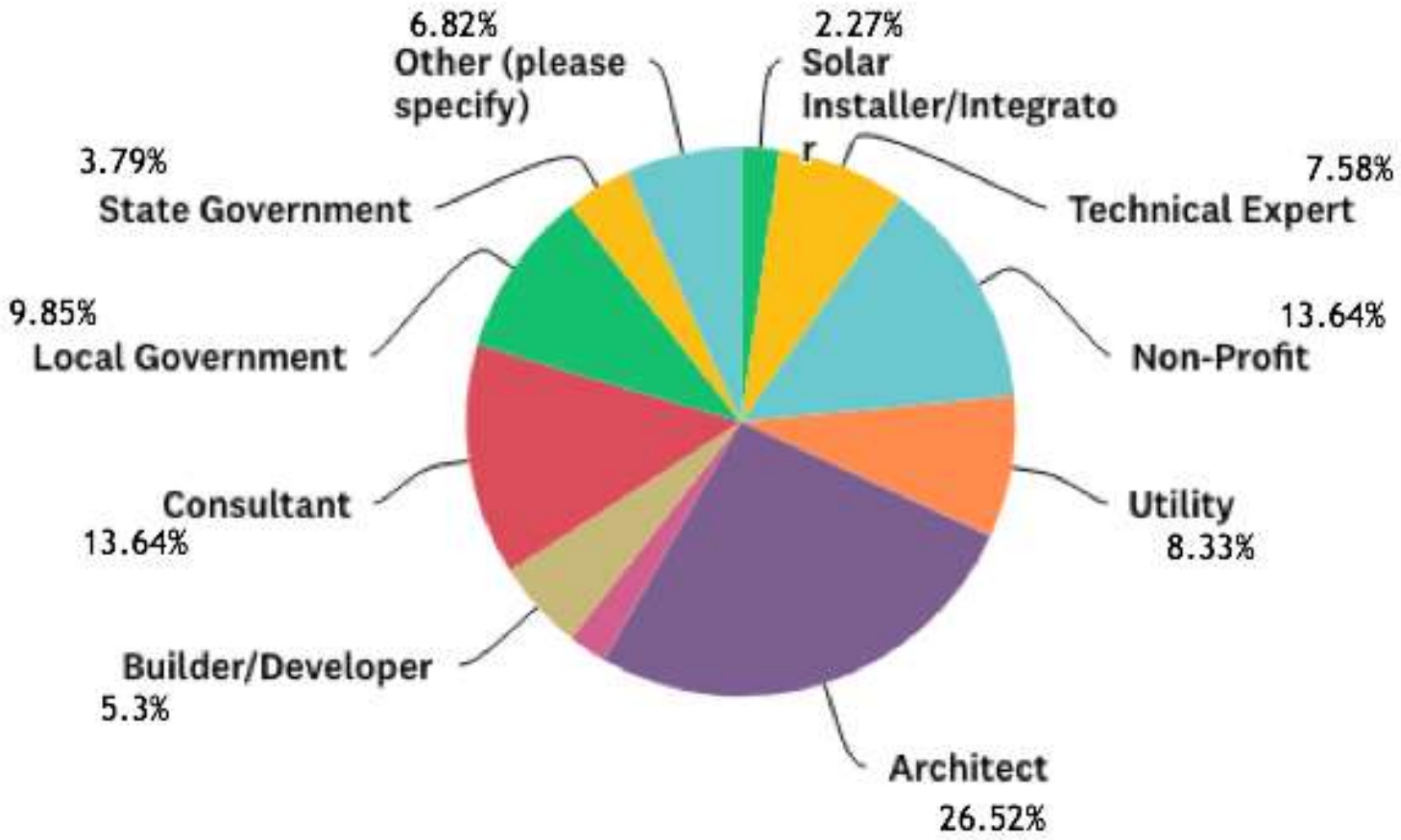


Overview 2020 New Residential Construction

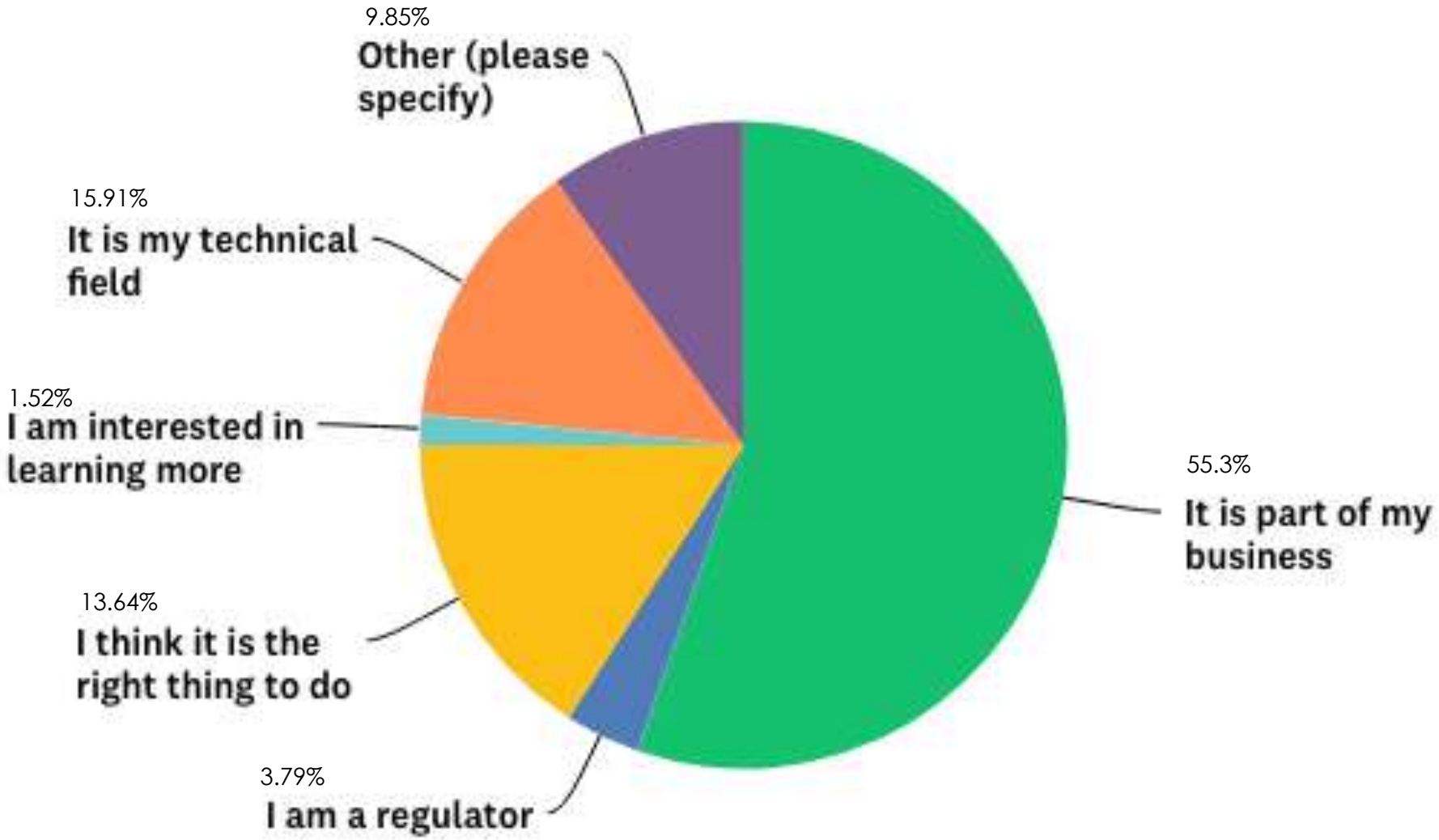
Online survey to industry professionals throughout California to understand interests and potential for new residential construction program and potential pilot alternatives.

- Respondents: 132 total
- High level of concern for climate change impacts and desire to enact change among all respondents
- Low carbon housing is an optimal strategy to work towards mitigating climate change

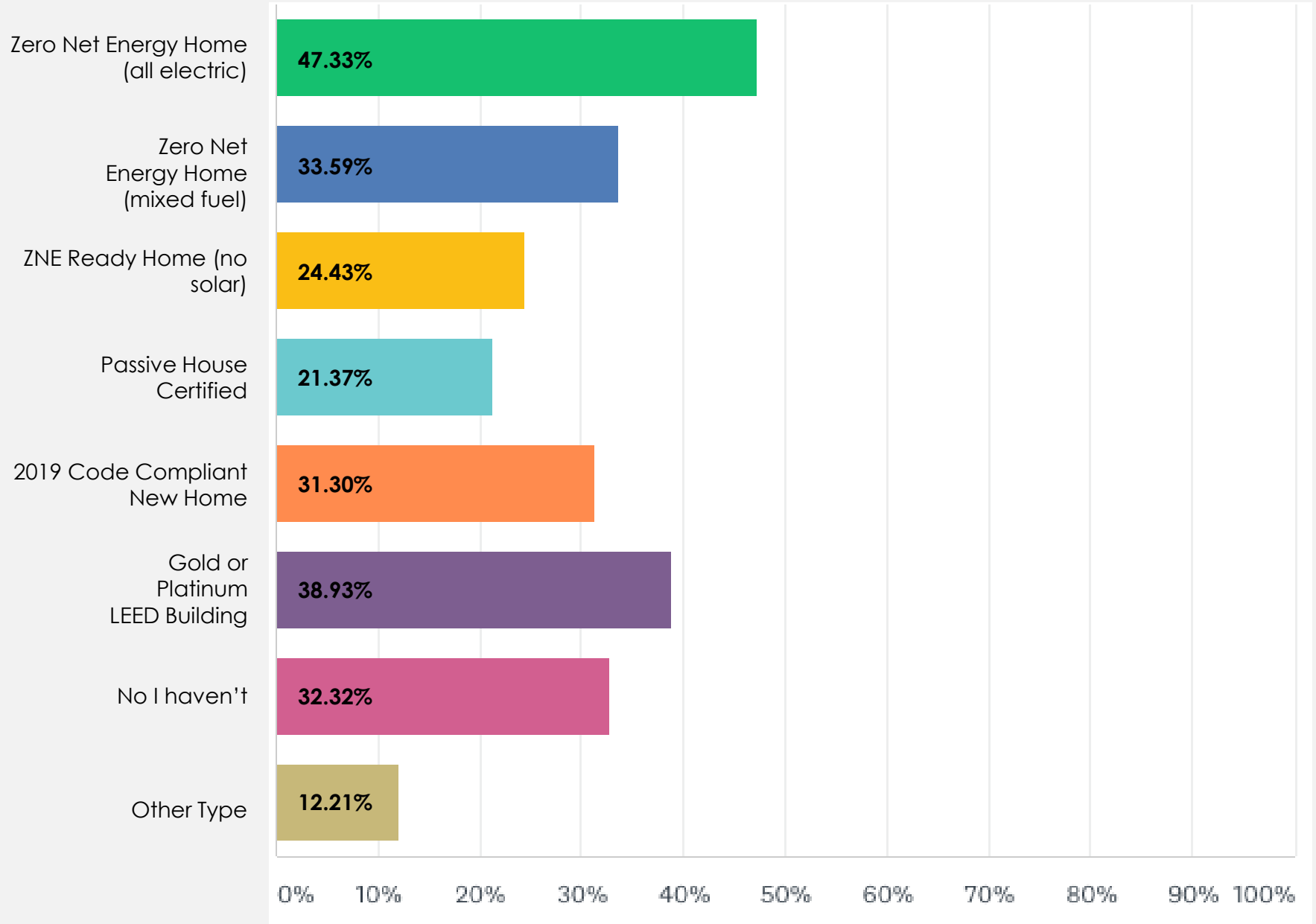
What is your affiliation or profession?



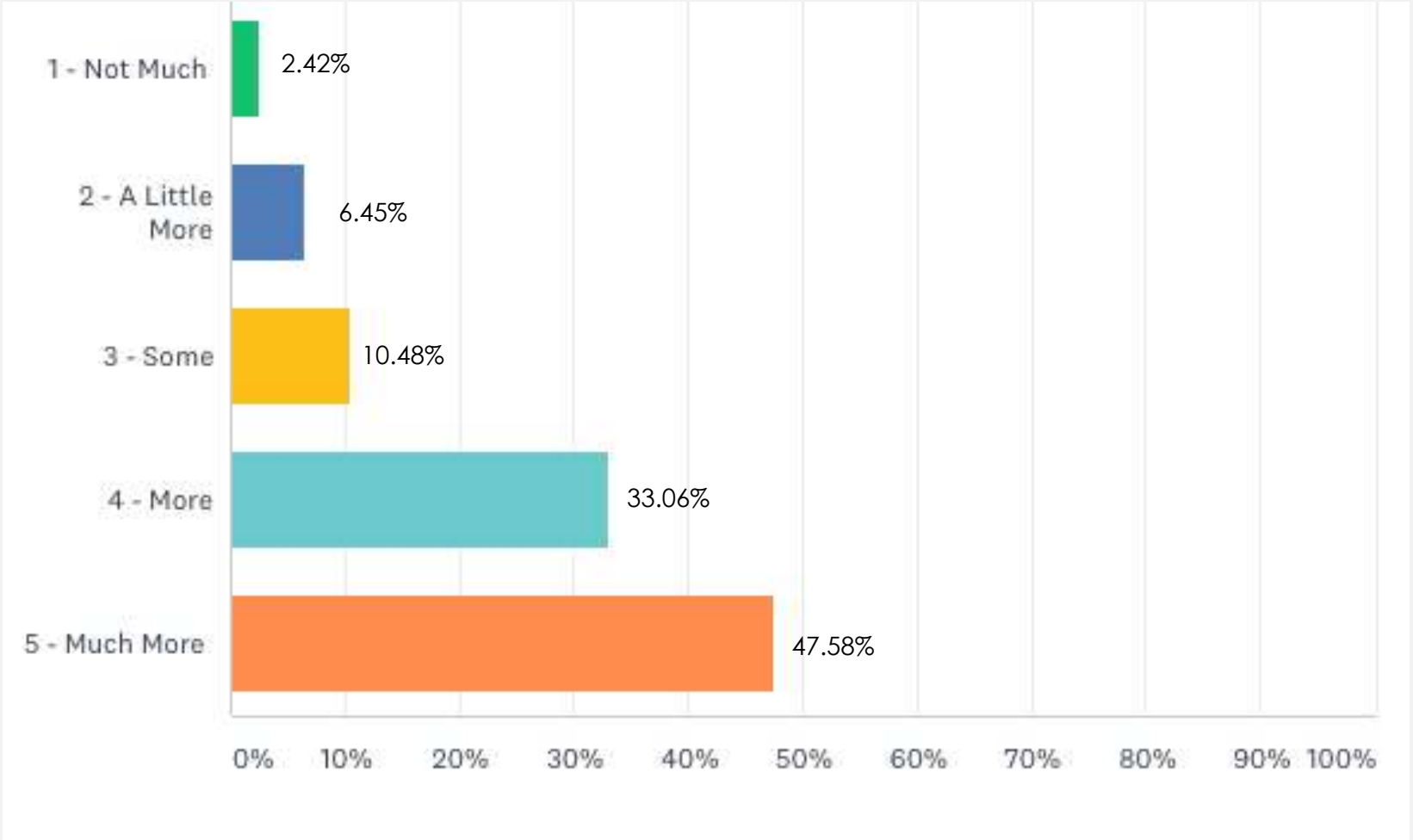
What is your primary interest in energy efficiency and high performance building?



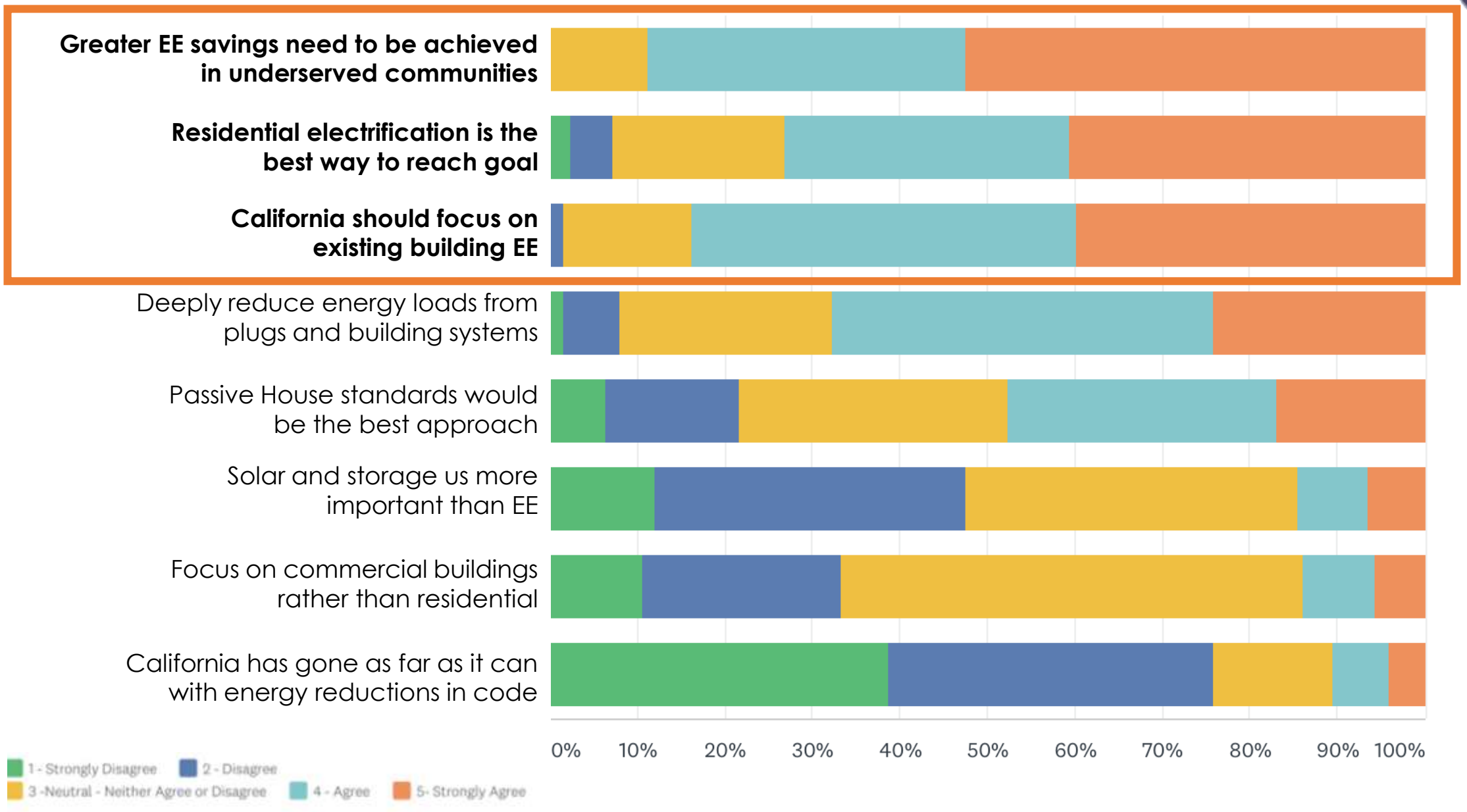
Have you been directly involved in designing or building any of the following types of homes or buildings?



How much more can new residential construction reduce carbon emissions beyond the 2019 code on a scale of 1 to 5?



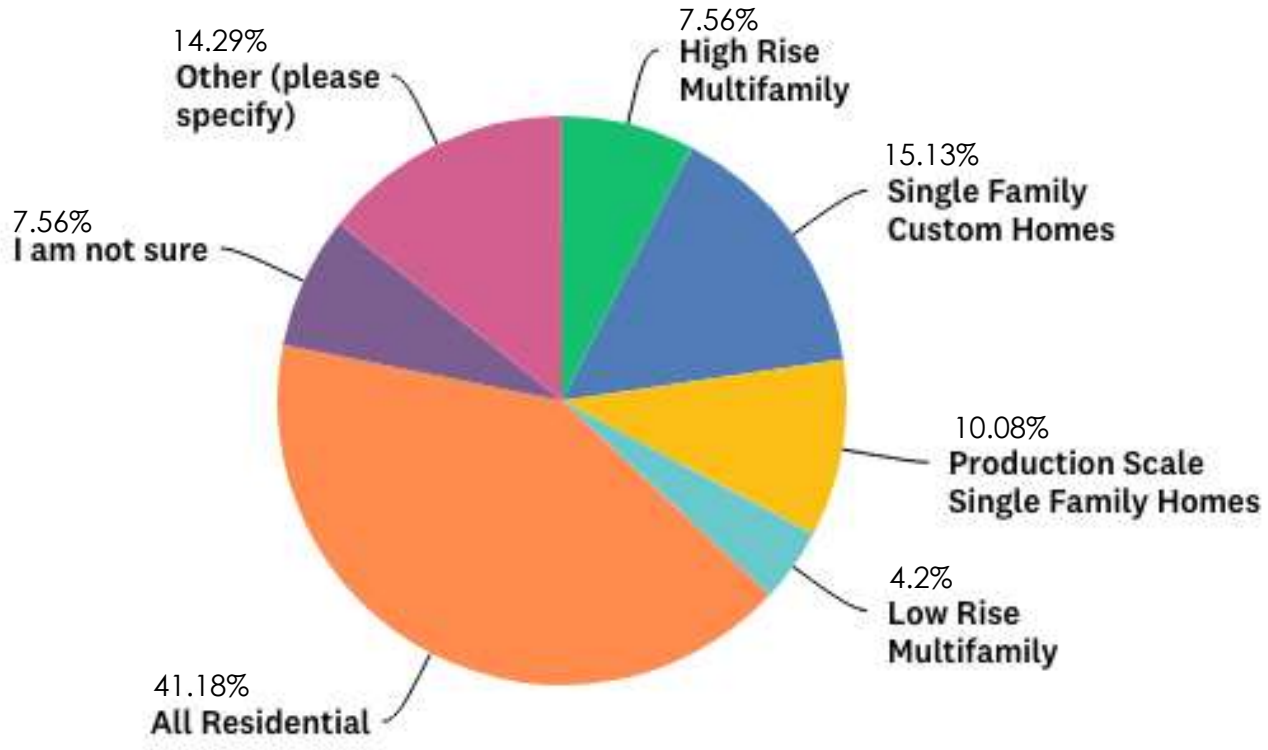
Please rate the following statements on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree).



Additional Comments

- Need awareness, control, and knowledge of **Distributed Energy Resources** (DERs)
- California should integrate **thermal energy systems** within buildings
- Focus on carbon content of the grid and active grid management to enable **electrification**
  - Test for air tightness, downsize systems, and increase proper installation of heat pumps and commissioning
- **Zero Carbon buildings** in California by 2022
  - Consider banning Fossil Fuels from all new buildings
  - Efficient storage, load shifting, and demand response are crucial to maximize benefits of electrification and renewables
  - Housing should be regenerative and switch to a 24 volt system enterprise
  - Consider design strategies and embedded energy in materials while examining building codes
- New homes perform substantially better than typical existing homes, but the **resources and compliance mechanisms to support even greater reductions do not exist**

What building type/market do you think would be best suited for passive house standards?



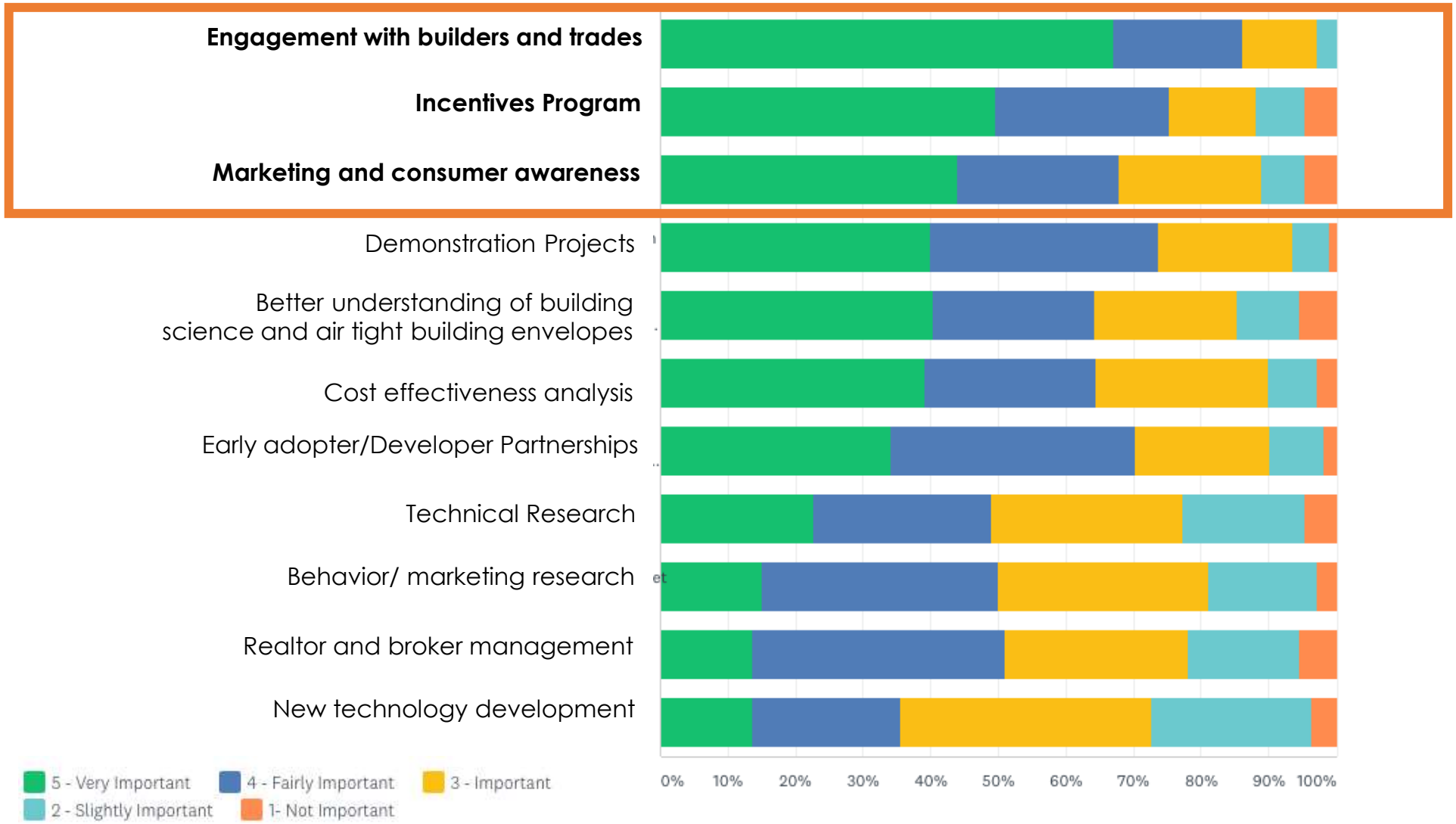
1) All Residential
2) Single Family Custom Homes
3) Other
   - All buildings can be passive house

Additional Comments

- Achieving Passive House levels of airtightness is inordinately costly relative to the gains achieved;
    - Distinguish between the generic non-branded "Passive" approaches, and the branded "Passive Houses" approaches
- Consider production of homes that are more airtight than current construction even if they don't achieve Passive House tightness.
- The cost for implementation may be too high for residential buildings
- T24 is at passive house standards for insulation, but needs air-sealing.
- Increase better HVAC solution for homes, and HRV is promising

What are the most CRITICAL NEEDS to assess passive house standards and their feasibility for future code cycles?

Please rate on a scale of 1 (not important) to 5 (very important)



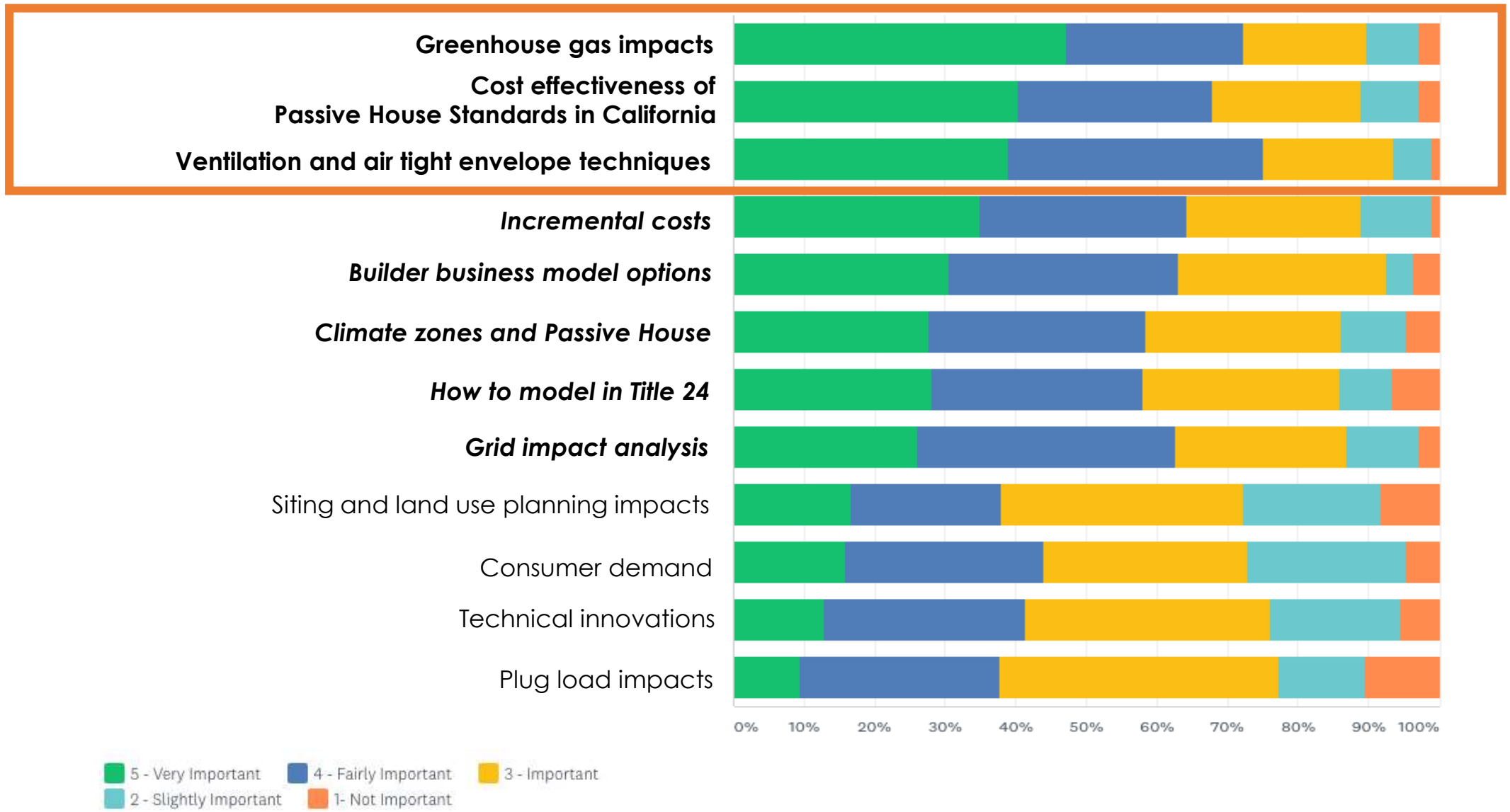
Additional Comments

- The economics of Passive House make little sense in many CA climates. Too much money and effort is spent on enclosure, which is not where we stand to make the biggest efficiency gains
    - Consider researching methods to transform Schools into Passive House
    - Passive House design is more focused on heating than cooling and ignores opportunities for natural and mechanical cooling using ventilation
    - Passive House standards would be particularly impactful in the low to mid-rise multi-family housing market, which is already densely populated and served by public transit

Additional Comments

- Review and implement well adopted designs from Europe, Canada, NZ/ Australia, and increasingly China.
- Invest in education for professionals in the AEC industry
- Demonstrate clear value gain to consumer
- Build more ZNE buildings, which uses a combination of passive envelope design, high efficiency HVAC, lighting and appliances and including solar thermal, along with PV/Wind and battery storage.
- Partner with production builders
    - Incentivize fuel substitution for new construction
- Consider a new HVAC package that combines HRV, heating, cooling, and hot water in a single unit

What are the most important research activities for passive house standards analysis on a scale of 1-5?

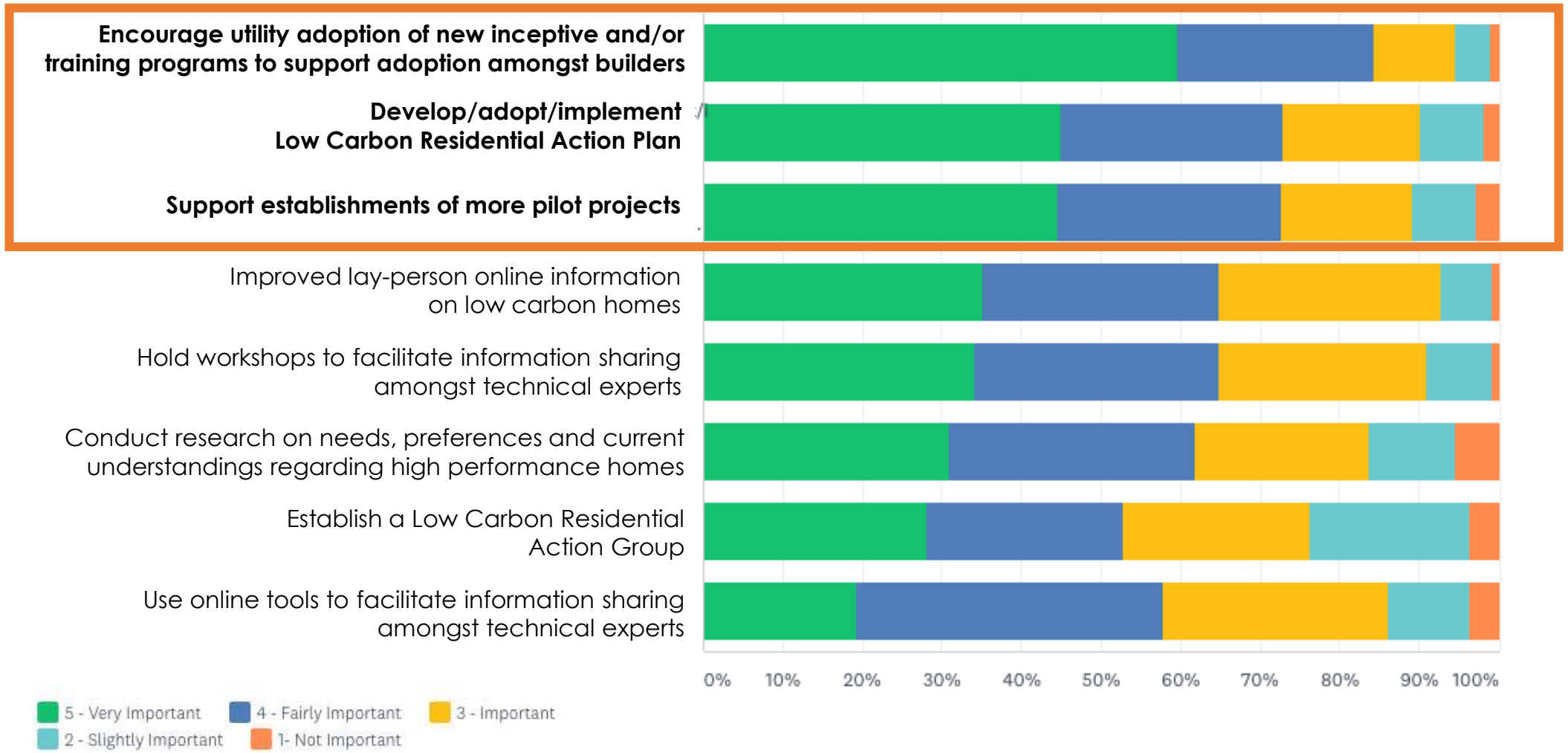


Other Research

- Technical and Smart House and Material Research are critical
- Research life cycle carbon reduction impact
- Research should include all flavors of passive homes including PHIUS and the 1970's designs.
- Ventilation standards for all buildings
- Health Benefits

What are the most important steps the CPUC can take?

Please rate the following on a scale of 1 (Not Important) to 5 (Very Important)



Additional Action Steps

- What are the most effective measures, by housing type, vintage, condition, and climate- apart from any formulaic, branded "Passive House" approach
- All actions should be preceded by an assessment of what Passive House brings to the table that current or future codes do not.
- Incentive programs and consumer outreach through methods other than workshops
- Reflect on creative local governments like West Hollywood are handling it through the design process and not through one size fits all, prescriptive regulations
- Consider microgrid and neighborhood producing energy

Additional Actions

- Increase developer relationships, incentives, supply chain
- Meet with builders to discuss market viability and cost implications
- Pilot projects with largest home builders to teach them the system
- Consumer education. Make Passive House an energy code compliance
- Establish whether the building goal is low carbon or zero carbon

Questions & Discussion

Notes

VISION

100% of all New Homes in California will be Zero Net Energy starting in 2020

GUIDING PRINCIPLES

ACTION PLAN GOALS

Breakout session #1

What is our vision for 2026? 2030?

- Automatic breakouts
- Please introduce yourselves
- One person is given Facilitator role
- Report back top 3 ideas

Notes

Breakout session #2

What are the goals or key components to get there?

- Automatic breakouts
- Please introduce yourselves
- One person is given Facilitator role
- Report back top 3-5 ideas

Notes

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