To: City of Boulder, Boulder County, Mitsubishi Electric, Radiant Labs, CLEAResult
From: Meister Consultants Group, A Cadmus Company
Date: February 14, 2018
Re: Summary of Boulder Workshop, City-Industry Building Electrification Initiative

SECTION 1 OVERVIEW AND KEY FINDINGS

On Thursday, February 1, 2018, representatives from the City of Boulder ("the City"), Boulder County ("the County"), CLEAResult, Radiant Labs, and Mitsubishi Electric convened in Boulder to foster a public-private collaboration to implement the Carbon Neutral Cities Alliance (CNCA)-funded Building Electrification Initiative (formerly the Thermal Decarbonization Initiative) in Boulder.

Key meeting goals and outcomes included:

- Refining the design of a collaborative marketing, outreach, and education campaign to support adoption of air source heat pumps (ASHPs) through Boulder's pilot building electrification program
- Establishing a collaborative workplan for program design and implementation between the City, County, Radiant Labs, CLEAResult, and Mitsubishi to support the pilot program
- Engaging contractors participating in (or expected to participate in) the County's EnergySmart program to discuss experiences installing ASHPs and receive feedback on program design
- Discussing industry development and exploring pathways for long-term engagement to expand and strengthen the local contractor network

Key conclusions for designing and implementing Boulder's year-long pilot program in April 2018 as part of the Building Electrification Initiative include:

- **Opportunities for collaborative marketing were clarified and discussed in greater detail.** In particular, Boulder's year-long program, divided into two phases (cooling season and heating season) provides a valuable opportunity for testing differing marketing messages and targeting diverse market segments. Participants discussed a variety of potential marketing messages and market segments, and refinement of these options will be a critical next step in program development.
- **Initial pathways for coordination between the City, County, and Mitsubishi were established.** In particular, participants made significant progress in establishing pathways for coordinating marketing campaigns and lead management, given previous concerns from both the City/County and Mitsubishi. Additional discussions to clarify coordination in marketing and lead management (as well as responsible parties) between the City, County/EnergySmart Program, and Mitsubishi will need to occur prior to launch.
- **Barriers related to contractor perception and presentation of cold climate ASHPs will be challenging to overcome.** While participating contractors were generally interested in participating in the pilot program (and continuing to engage in the City's industry working group), contractors expressed

concerns with the suitability of existing central ASHP options for addressing Boulder's forced hot air-dominated building stock, cost-competitiveness relative to conventional furnace/central air conditioning options, and risk aversion related to recommending cold climate ASHPs to customers as a sole source of heating. Overcoming these barriers—e.g. through contractor and customer education and development of new models of ASHPs—will be critical to driving the adoption of ASHPs in the medium- to long-term, particularly related to whole-home applications.

- **Further development of the local ASHP installer base remains a priority.** The pilot program will primarily engage well-established ASHP-installing contractors, and broadening the local contractor base is a secondary priority to the design and launch of the pilot program. Increasing local access to training and certification programs will be necessary to grow the local contractor base, and Mitsubishi is expected to explore expansion of training program opportunities in the Boulder region in Fall 2018.

Workshop participants established a follow-on conference call to refine the pilot program marketing strategy on **Friday, February 23 from 11:00am-12:30pm (MST)**. Additionally, participants identified the following next steps and individuals responsible for coordinating follow-on action, with the goal of launching the pilot program by April 2018.

Follow-up task and description	Lead	Support/Participation
Establish target customer profiles. Additional discussion will be necessary to clarify target customer market segments and how to engage them through marketing efforts	Mitsubishi (Mike)	County/CLEAResult (Dave/Jen) + Radiant Labs (Jeff)
Develop targeted marketing messages for key customer market segments. Based on target customer profiles established, develop marketing messaging, approaches, and activities tailored to these customers	TBD	
Provide additional information on lead closure rates. Additional information regarding the lead closure rate for previous marketing efforts will be needed to more clearly establish goals for marketing	Mitsubishi (Michelle)	MCG (Jeremy)
Continue discussion regarding lead management process. Additional discussion to clearly establish lead management pathways will be necessary to coordinate marketing efforts and clarify roles and responsibilities	Mitsubishi (Sam)	City (Elizabeth), County/CLEAResult (Dave/Jen)
Collect additional information regarding existing installation baseline. In order to establish installation targets for the pilot program, the City will need to clarify the baseline level of annual installations in the City with active contractors (beyond installations recorded in City permit databases)	City (Brett)	

Convene follow-up calls. In addition to the follow-up call on February 23, additional calls between key parties will be necessary to meet program target launch date	City (Brett)	
Establish and coordinate regional distributor marketing strategy. Regional Mitsubishi distributors will need to be engaged to discuss how to coordinate marketing with Mitsubishi, participating contractors, and the City/County	Mitsubishi (Jim & Curt)	
Discuss marketing materials and conduits. In addition to refining messaging, additional discussion	County (Tyler) + City (Alexi)	Mitsubishi (Sam)
Clarify organization key points of contact**	All	

***Sam Beeson will serve as overarching point of contact for Mitsubishi; Brett KenCairn will serve as overarching point of contact for City of Boulder*

The following sections provide a summary of discussion throughout the workshop. Additionally, Appendix A provides the meeting agenda and Appendix B includes a list of workshop participants.

SECTION 2 SUMMARY OF WORKSHOP DISCUSSION

2.1 Introductions and Workshop Goals

Stakeholder Group	Goals, Concerns, and Other Notes
City/County	◉ Need to develop a clear action plan and next steps for designing and implementing the marketing program ◉ Critical to finalize and clearly establish what "collaboration" means in this context ◉ Program(s) must drive GHG reductions and displace gas ◉ EnergySmart could be a great conduit to drive ASHP adoption ◉ Important to integrate ASHP and Boulder initiatives into local industry: engage green builders and communities with a proven technology approach; build out suppliers/contractors to ensure equipment needs can be met ◉ How best can we make it cost-effective and convenient to get off of gas? ◉ Concerned that process of purchasing an ASHP in Boulder is not currently easy/straightforward ◉ Some concerns about magnitude of task and bandwidth
Mitsubishi	◉ Better understand how best to support Boulder's campaign and Boulder's marketing perspective and how to run Boulder and Mitsubishi plans in parallel

	◉ Gain stronger understanding of how to "ramp up" Mitsubishi's presence: how to communicate to distribution partners and formulate strategy to communicate to contractors ◉ Concerned to ensure program can deliver on promises in marketing efforts: word of mouth is great for building buzz but can also kill momentum ◉ How best to message out benefits of technology and make it easy for customer to recognize benefits and act upon them proactively (as opposed to reactively) ◉ Concerns about budget for marketing activities
Others	◉ Interested in learning more about how best to make mini-splits work in retrofit applications in existing ranch-style homes with lots of small rooms ◉ Excitement to vet data assumptions (e.g. in Radiant tool) with a marketing and outreach pilot program

2.2 Summary of Morning Discussion

Notes included in this section are intended to supplement the slides presented by the City, County, Mitsubishi, and MCG during the morning session. Please refer to those slides for reference. Discussion outside of presentation often focused on market challenges.

Topic Area	Discussion
Economics. General acknowledgment that ASHP adoption is not economical for most homeowners at this time; more work needs to be done to bring down incremental cost (e.g. incentives, increased supply chain development, disincentivization of gas)	◉ Striking balance between comfort and cost can be a challenge ◉ Competing incentives are challenging, though EnergySmart expects to discontinue gas rebates by end of Q1 2018 (though, does eliminating rebates for high-efficiency gas encourage people to go with standard efficiency?) ◉ EnergySmart financing can be leveraged to help drive adoption (12-year loan with <3% APR for top-end credit) – no defaults to date!
Proactive vs. Reactive. Challenge of encouraging proactive adoption of higher-efficiency equipment	◉ Most purchases made under duress lead to purchasing federal minimum standards (for AFUE and SEER) ◉ Mandates are not possible due to federal preemption of building codes
Housing stock needs	◉ Contractor base needs to be aware that hybrid ducted/ductless systems are available ◉ Addressing challenges in multifamily with condo associations and split incentive/owner-occupancy challenges ◉ Need to address affordable housing
Contractor advocacy for technology. Contractors are not actively pushing ASHPs—even	◉ Kendra had Diamond Contractors try to dissuade her from installing an ASHP system; sales people did not know how to talk about the technology, couldn't determine if electrical service upgrades were needed, felt system couldn't perform below 0°F, etc.

existing Mitsubishi Diamond Contractors	◉ Concerning for City/County marketing ASHPs and for Mitsubishi passing leads to those Diamond contractors (who are expected to lead with Mitsubishi as part of agreement)
Perceptions of cold climate performance	◉ Contractors are not confident that ASHPs can serve whole-home applications and won't propose them in replacement scenarios (esp. with altitude derating) ◉ Wind Chill ≠ dry bulb temperature!
Industry development. Beyond broadening sales knowledge, greater comfort needed to broaden beyond existing "sweet spot" business model	◉ E.g. Mitsubishi ductless system has high equipment costs, low labor compared to standard low equipment, high labor costs ◉ Challenging for Mitsubishi to "nudge" contractors out of what has worked for decades, often rely on brand/business model ambassadors (e.g. Mike Cappuccio, N.E.T.R., Greater Boston) ◉ Mitsubishi expects to be able to broaden training reach for new Diamond contractors (e.g. greater emphasis on eLearning in 2018) – currently limited # of Diamond contractors in Boulder and <50 across the state ◉ General HVAC labor shortages across the country, and greater outreach to LMI communities to drive enrollment in trade schools/community colleges is needed
Marketing messaging	◉ Nobody knows what an "air source heat pump" is; Mitsubishi doesn't really use the term on marketing materials and focuses on "zoned comfort solutions"

2.3 Contractor Discussion

This section summarizes key points of discussion during the contractor working lunch session.

Topic Area	Discussion
Cold climate performance. Contractors have significant concerns about risk management related to installing ASHPs, specifically related to installing them as whole-home systems without backup.	◉ Contractors have concerns about the system potentially shutting down below -13°F, but acknowledged that they have never fielded any calls about Mitsubishi systems shutting off or not producing enough heat (e.g. one contractor has 100% Mitsubishi without backup and has had no issues), but nonetheless don't want to be the one to tell a customer not to worry about it—even going so far as to put disclaimers on proposals that the system shuts off below -13°F. ◉ Additional BIN data provided by the City/County on # of hours below shutdown threshold per year could be helpful, so that contractors can point to a City/County data source. However, data is not the be-all end-all, but rather a tool to support the conversation that goes into every job.

	◉ Note: Mitsubishi found this discussion very confusing and is concerned about how contractors are approaching this. Reflects the tendency to oversize due to risk aversion.
Customer education is a significant component of a sales call related to ASHP, whether ductless or ducted. The degree of education necessary is often double compared to other conventional systems, which turns a sales call into an education call.	◉ Improved customer education from the City/County program to qualify leads could be valuable to reduce education time and improve lead conversion ("a perfect world"), though some contractors noted that even when customers are educated on the technology they "think they know what they want [but don't]" o Additional collateral (e.g. videos, one-pagers, etc.) to send to the customer ahead of time or watch on-site could also be helpful. ◉ Overcoming conception around "electric heating is bad, gas heating is good" will be a challenge because people don't understand what heat pumps are. The City/County program expects to focus higher-level education related to renewable energy/sustainability plans around this concept (e.g. to provide direct action for customer who want to get off of gas). ◉ It can be difficult to conceive of how loud a system is (nobody knows what a decibel is), and contractors are inviting them into the office or using mobile apps to demonstrate. ◉ Aesthetics and intrusive installation process can be an initial concern, but people usually stop noticing the minisplit head after a while.
Installer capacity	◉ Contractors noted that an increase in customer leads/sales for ASHPs would not be a significant challenge to meet; they would simply turn down more furnace jobs and focus more on addressing the ASHP leads.
System costs and technology suitability. Contractors noted that systems are significantly more expensive than a quick furnace/AC replacement, with a significant difference between furnace/central AC and a whole-home ductless or hybrid ductless/ducted ASHP system.	◉ Contractors note that they are not selling systems on price, but rather on home comfort and zoning. Achieving mass market will require that a central ASHP be closer in cost between high efficiency furnace + central AC (~$15,000). Currently often $20-25,000 for whole-home ductless. ◉ Explaining pricing can be very challenging given the factors that can go into jobs, particularly for whole-home systems. ◉ Contractors prefer to work with the existing distribution system in retrofit applications (majority forced air in Boulder). However, there is no drop-in replacement: unitary (and Mitsubishi ducted) offerings are inadequate, as maximum output (~4-tons) with altitude derating and airflow for ducted systems can't meet winter needs for many homes o To provide zoning and work around technology limitations, some contractors will shut off ductwork to part of the home and do a ducted system there with ductless for other zones o An 80kbtu ducted system could meet the needs of the majority of homes ◉ A lot of dual-fuel systems are installed with controls to switch to gas around 25-30°F. Kumostation could help to do this with Mitsubishi applications when not installed as a dual-fuel system.

Additional feedback on marketing	◉ Some contractors expect that emphasizing displacement applications will be more effective to raise awareness and get more people into the market—then move into multi-zone in future programs. ◉ "Early retirement" messaging could be valuable, but need to be sensitive about how it's used.

2.4 Summary of Afternoon Discussion

Topic Area	Discussion
Goals of Program	◉ Need to establish some sort of target for deployment to establish marketing efforts (and budget) necessary o E.g. Double # of previous sales this year to demonstrate results and serve as catalyst to observers and neighboring cities ◉ Mitsubishi understands it is not feasible to be Mitsubishi-only—e.g. if 300 sales achieved, would like to get to 60-70% of those o Largest concern around ensuring that leads Mitsubishi passes onto contractors do not result in other brands being installed—equipment standards that exclude more unitary, non-cold climate brands could be valuable ◉ Deploy program through EnergySmart brand/infrastructure, but program needs to be accessible to County residents (though City will put more money in to help with City deployment) ◉ Establish a model that can be replicated across cities ◉ Uncover local barriers to deployment ◉ Test messaging and marketing approaches (e.g. network of ambassadors, case studies, best practices) and refine for future rounds ◉ Maximize education opportunities across industry and consumer networks ◉ Engage Xcel (esp. strategic electrification group) as a program collaborator
Incentives and Financing	◉ Need to both nail down and effectively communicate rebate (e.g. City, EnergySmart, Mitsubishi) and financing (e.g. EnergySmart, Synchrony) package to drive action o Need to communicate not just to incentives, but also to distributors and contractors o Mitsubishi potential to work with Synchrony and JB Associates (12-year labor warranty) for special programs/incentives ◉ Need incentive stability: don't want it to run out before program concludes
Branding	◉ EnergySmart "CoolSmart" in the summer, "HeatSmart" in the winter?
Lead Management	◉ Separate Mitsubishi and City/County marketing campaigns and lead intake/management pathways o Coordination around common messaging ◉ Mitsubishi can message that it's supporting the EnergySmart program, though need to clarify how this is written out ◉ Unclear how best to track/share data across lead intake pathways

	○ In theory everyone should be pulling a permit, and heat pumps are now part of the permit process
Target audience	◉ Focus on low-hanging fruit customer segments to maximize success of initial campaign ○ Focus on Radiant Tool/heat mapping (e.g. overheating small ranchers in spring/summer), focus on owner-occupancy to start ○ E.g. EnergySmart participants without PV/no new furnaces (near-term replacements), focusing on those with best cashflow ○ AirBnB short-term rental license list (due to requirement for AC) ◉ Focus on cooling target audiences in first half, heating in second half
Marketing and outreach approach	◉ Key messages: Early Retirement, Year-Round Comfort, Healthy Homes, Electrify your Lifestyle, Take More Control of Your Home, "Energy in the Air," rebates/financing available ○ Refine targeted submessaging for Radiant-identified marketing segments ◉ Need to work backwards from installation target to get to marketing effort necessary (e.g. sales -> leads -> marketing impressions) ◉ Need to build confidence in system operation (e.g. case studies/date, 12-year warranty on labor from JB) ◉ Efficiency not a key driver in messaging—efficiency is expected at this point ◉ Seasonality important for targeting messaging—e.g. push early retirement during shoulder seasons ◉ Coordinate on search terms online to make sure parallel campaigns are not competing against each other ◉ Displacement and replacement both important, but different messages – may be more valuable to start with displacement (or not emphasize one approach or another—target marketing benefits around displacement and people may start there to move at their own pace) Parallel marketing campaigns ◉ 1) Mitsubishi Campaign ○ Looping Boulder into nationwide, city-focused awareness campaign ○ Digital marketing in Feb-Mar ○ Lead generation + TV campaigns in April ○ Could be possible to target some of this marketing to Boulder (e.g. Flatirons in the background)? ◉ 2) Distributor (Regional) cooperative campaign ○ Contractors does marketing campaign w/ cooperative funding from distributor/Mitsubishi (e.g. $30k budget = $10k from distributor, $10k from Mitsubishi, $2k from each of 5 contractors), Mitsubishi supports design of marketing campaign with contractors ○ Contractor gets leads from those efforts ◉ 3) Public Awareness/Electrification Campaign (City) ○ Early stages ○ Focused on broader electrification (not just heat pumps), clean electricity, branding around initiative

	○ Focus on themes of security, health and local control ○ Find "surrogates" to advocate on behalf of the campaign ○ Grassroots advocates/organizers can push more aggressively against gas industry ◉ Radiant/Fuel Switch Pilot (ongoing) ○ 20 installs, focused on moving homeowner through the Radiant energy roadmap process ○ Aims to turn homeowner into a high-value lead ○ Leverage support from Mitsubishi videos and marketing materials
Timeline	◉ Year-long program through EnergySmart aiming to launch in late-April (Earth Week) in conjunction with launch of non-violent anti-fracking grassroots action ◉ Broken up into two pushes: start with cooling focus in late-spring, heating focus in fall
Industry development	◉ Not critical to do this immediately—should focus on getting first phase of program out ◉ Loop back to increase training capabilities in the area (with focus on mobile training) in the fall ◉ Concerns about some of the other Diamond/EnergySmart contractors in the area (e.g. EcoMechanical and Mesa not responsive)
Lingering challenges and concerns	◉ EnergySmart concerned about capacity for managing marketing + administration throughout the year-long program ◉ How best to provide information on pricing? Hard to be prescriptive because equipment is ~30-40% of the cost with lots of labor variables ◉ How best to transition from displacement to replacement messages ◉ Addressing low owner-occupancy challenges ◉ Data sharing/privacy concerns: how best to share lead information between Mitsubishi and City/County for reporting purposes (with separate lead intake processes), NDA ◉ 3-4 week lead time needed to create marketing materials (Mitsubishi)

APPENDIX A: WORKSHOP AGENDA

City-Industry Building Electrification Initiative | Boulder Workshop

(formerly the "Thermal Decarbonization Initiative")

Monday, February 1, 2018 | 8:30 am – 5 pm
3065 Center Green Dr.
Boulder, CO, 80301

MEETING GOALS & OUTCOMES

- Identify opportunities for collaboration among manufacturers, city leaders, and other key players
- Design collaborative marketing and outreach campaign to support Boulder's pilot program
- Discuss industry development and create pathway for long-term engagement to strengthen contractor network
- Engage existing contractors and receive feedback on program design
- Foster new connections, gain valuable perspectives from attendees, and have fun!

PARTICIPANTS

Workshop participants include representatives from:

- City of Boulder
- Mitsubishi Electric
- Boulder County
- CLEAResult
- Radiant Lab
- Meister Consultants Group, A Cadmus Company (MCG)
- Local contractors (lunch session only)

DETAILED AGENDA

8:30 am to 9:00 am	**Breakfast and Networking** Participants arrive for the event, enjoy breakfast, and network.
9:00 am to 9:15 am	**Welcome & Vision** Brett KenCairn, City of Boulder Eric Dubin, Mitsubishi
9:15 am to 9:40 am	**Introductions and Run of Day** Neil Veilleux, MCG
9:40 am to 12:00 pm	**Presentation & Discussion**

	Presentation Order: ◉ Neil Veilleux, MCG: City-Industry Building Electrification Initiative (5 min) ◉ Brett KenCairn, City of Boulder: Boulder Roadmap to Renewable Living (10 min) ◉ Jen Harper, Mitsubishi: Energy Smart Program (10 min) ◉ Curt Spressor, Mitsubishi: State of the Market, Curt Spresser (15 min) ◉ Jim Topalian/Michelle Robb, Mitsubishi: Mitsubishi Regional Marketing Update, (15 min) ◉ Gerry Heidrich, Mitsubishi: Contractor Development (15 min) ◉ Adam Stenftenagel, Radiant Labs: Tool Demo (30 min)
12:00 pm to 1:00 pm	Lunch with Industry Advisory Group Jeremy Koo, MCG (presenter & facilitator) Neil Veilleux, MCG (facilitator) All discuss program options
1:00 pm to 2:50 pm	Facilitated Discussion: Marketing and Outreach Neil Veilleux, MCG (facilitator) Jeremy Koo, MCG (facilitator/program design expert) All discuss (see facilitation framework in appendix)
2:50 pm to 3:00 pm	BREAK All take 10-minute break. (Timing flexible depending on length of Marketing and Outreach discussion).
3:00 pm to 4:00 pm	Facilitated Discussion: Industry Development Neil Veilleux, MCG (facilitator) Jeremy Koo, MCG (facilitator/program design expert)
4:00 pm to 4:10 pm	BREAK All take 10-minute break.
4:10 pm to 4:35 pm	Review and Next Steps Brett KenCairn, City of Boulder works with group to identify concrete next steps, including: ◉ Key tasks ◉ Roles and responsibilities ◉ Timeline for action ◉ Other next steps
4:35 pm to 5:00 pm	Debrief and Close Neil Veilleux, MCG Brett KenCairn, City of Boulder

APPENDIX B: WORKSHOP PARTICIPANTS

Organization	Name and Title	Contact Information
City of Boulder	Brett KenCairn, Senior Environmental Planner	kencairnb@bouldercolorado.gov
	Kendra Tupper, Chief Sustainability Officer	tupperk@bouldercolorado.gov
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