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Please see the attached document.

Additional submitted attachment is included below.



Johns Manville

A Berkshire Hathaway Company



**Comments of Johns Manville and Nest on the CEC August 12, 2016 Workshop
Regarding Barriers of Low-Income and Disadvantaged Communities to
Energy Efficiency and Renewable Energy**

These comments are submitted by Johns Manville (JM) and Nest Labs, Inc. (Nest) in response to the issues discussed at the above-referenced Workshop. We commend the Commission for holding the Workshop to discuss why disadvantaged communities are frequently underserved when it comes to energy efficiency and renewable energy.

The purpose of these comments is to share our experience both with a large-scale residential energy efficiency retrofit project in the Coachella Valley of eastern Riverside County as well as the planning underway to expand that project to other geographic areas and additional efficiency features.

The Coachella Valley project is being funded by the South Coast Air Quality Management District (AQMD) under the mitigation funds made available under AB 1318 (Perez) for the Sentinel Power Plant. The purpose of those funds was to implement projects that would help offset the air emissions of that new plant, there being no emission reduction credits available.

JM installation partner **Add Insulation** was initially awarded \$3.25 million in late 2013 to perform basic efficiency retrofits on homes in either the AQMD-designated environmental justice area or in the disadvantaged communities in the Coachella Valley. The AQMD has twice expanded the funding to a total of \$4.0 million so that by the end of 2016 approximately 2,000 homes will have been retrofitted.

To our knowledge, this project is the first project of its kind in that it was funded and overseen by an air quality regulator for the purpose the emissions reductions and disadvantaged community benefits that can be achieved via energy efficiency, and not just for the sake of saving energy. The Coachella Valley project has been successful enough that it is now formally part of the AQMD's Air Quality Management Plan: Control Measure No. ECC-02 ("CO-BENEFITS FROM EXISTING RESIDENTIAL AND COMMERCIAL BUILDING ENERGY EFFICIENCY MEASURES [NOX, VOC]").

Rather than perform a deep efficiency retrofit with advanced diagnostics, it was decided to perform a basic retrofit on each home so that more homes could be completed at lower cost and in a relatively short period of time. Given the vintage, architecture and condition of the modest homes in the Coachella Valley's disadvantaged communities, the work included air sealing the attic floor and adding loose fill fiber glass insulation to achieve R-38. None of the homes in the area had air sealing between the conditioned living space and the unconditioned attic. And the homes typically had degraded or poorly installed insulation to an effective level of only R-11.

Based on modeling with **EnergyPro** v5.1 software, each home should achieve energy savings of approximately 10%, which is approximately 1,560 kWh and 35 therms per home per year. Using US EPA-approved attribution methods these energy savings also achieved annual emissions reductions (both on-site and in the utility sector) of 1,630 tons of GHGs and 90 pounds of fine particulates.

In order to keep the cost per home under \$2,000, some new installation techniques and products were used. And using local crews to reach out to the community enabled us to limit the amount of funds spent on education, marketing and outreach to under 1.5% of the total project cost.

This is not a traditional low-income weatherization project; rather, it is an effective way to bring energy efficiency upgrades to the older, poor performing homes of moderate-income families whose annual incomes may exceed the low-income threshold but who have insufficient funds to make their homes more energy efficient. This project also helped serve members of disadvantaged communities who are chronically under-served by traditional low-income programs because they do not or cannot provide the copious required income and other documentation. Some families may simply lack the documentation or knowledge of how to acquire it. Or for reasons such as immigration status they may simply prefer not to have detailed interaction with government agencies.

Based on our results and expansion planning efforts we offer the following recommendations.

First, and most importantly, we strongly urge that the Commission recommend to State policy makers and implementers that they focus initially on energy efficiency. Unlike renewable energy (especially community renewables such as solar gardens), energy efficiency makes the home less costly to cool and heat and also makes it more comfortable (and even safer given the extreme temperatures of the Coachella Valley). And making the home more energy efficient increases its value, which is especially important for many in disadvantaged communities where the home is frequently the family's largest asset and source of retirement savings.

Second, we also recommend that residential retrofits in disadvantaged communities focus on those several features that are nearly universally needed in all homes and that also provide the greatest energy savings at the lowest possible cost. This approach obviates the need for an energy audit thereby allowing completion of a greater number of retrofits so that the State can actually meet its goals of GHG emissions reduction and doubling of energy efficiency, while directly benefitting disadvantaged communities per SB 535.

Third, we recommend that the State allow the delivery of energy efficiency retrofits to entire disadvantaged communities, not just those households who qualify as low-income. Many people who live in disadvantaged communities are not in poverty but still are unable to afford even a basic energy efficiency retrofit and most have older, pre-Title 24 energy inefficient homes. Relaxing this requirement not only increases the number of homes that qualify but also reduces program costs both by eliminating the need to do the income qualification and by allowing work crews to do adjacent houses instead of driving from one distant home to another.

The approach here does not remove the need for other types of low-income energy efficiency programs. Not all low-income families live in “disadvantaged communities” for example. Also some homes will need more measures than the most common standard measures. That said, the innovative approach pioneered in the AQMD Coachella Project is a way to rapidly accelerate the delivery of energy efficiency services to disadvantaged communities and households and accelerate the reduction of GHG emission envisioned in AB 32.

According to the original AB 32 Scoping Report, energy efficiency is being relied on to provide as much or more GHG emissions reductions as the RPS. This was reaffirmed in ARB’s May 2015 Scoping Plan Update where ARB states in Appendix C (**Electricity and Natural Gas Working Paper** at Page 23):

In addition to savings from efficiency standards for new construction, there is significant opportunity for savings in existing buildings. Of California’s 13 million existing buildings, more than half of residences and more than 40 percent of commercial buildings were built before 1978, when the state first implemented the [Title 24] Building Energy Efficiency Standards. This leaves open opportunities to significantly decrease energy use in the existing housing market using energy efficiency measures.

To meet the State’s climate goals, ARB plainly recognizes the magnitude of the task at hand (Page 24):

Deploying affordable and effective energy efficiency improvements in all of California’s diverse buildings will be a major challenge. **Millions of energy upgrades need to be initiated in existing buildings to meet the state’s efficiency and GHG reduction goals**, which will involve sizeable investments and program coordination for all building types in all regions of the state. (Emphasis added.)

Clearly, California needs to find ways to complete literally millions of retrofits in next ten years. This is simply impossible unless the State significantly changes the way it delivers residential energy efficiency improvements in disadvantaged communities so that both the completion time and cost are minimized. This will require many more projects like the Coachella Valley project that complete basic energy savings retrofits in many homes in a short period of time. These homes offer a significant opportunity to quickly achieve large aggregate energy savings and GHG emissions reductions.

Finally, we urge the Commission to look beyond existing mature renewable technologies such as solar and wind and instead to consider disadvantaged communities as opportunities for deployment of emerging technologies such as residential demand response and residential energy storage. Energy efficiency done correctly can enable residential demand response because the more efficient a home's envelope is, the more successful a cooling demand response event will be. Most families in disadvantaged communities will likely never enjoy a solar feed-in tariff (FIT) from rooftop solar. But if their home is made more energy efficient, they can do even better than the FIT by being paid extra money for saving extra energy via a demand response program.

Such demand response is achieved with the use of the advanced home energy management system – the ***Nest Learning Thermostat***, which can be one of Silicon Valley's greatest innovations for disadvantaged communities. And once a home is participating in a successful demand response program, it can also be part of the emerging energy storage effort. We are developing a concept for behind the meter, non-battery energy storage specifically for modest homes in disadvantaged communities. With some creative thought and new approaches we can make these communities a showcase for advanced energy technology.

Also, at the workshop, the Commission asked several panel members what their measure of success would be for disadvantaged community programs. Based on our Coachella Valley experience our success measures would include the following:

- Enhancement of health and safety along with energy savings – in both electricity and natural gas;
- Maximum emissions reductions from the energy savings, including both site/home reductions and reductions in the electricity grid serving the home;
- High customer satisfaction and engagement;
- Minimization of costs and maximization of the number of home upgrades through innovative installation techniques and products to achieve maximum aggregate benefits; and,
- A scalable, investable and sustainable business model to ultimately attract large amounts of private sector capital to help the State meet its climate, energy, and environmental goals.

About Johns Manville

Johns Manville, a Berkshire Hathaway company (NYSE: BRK.A, BRK.B), is a leading manufacturer and marketer of premium-quality products for building insulation, mechanical insulation, commercial roofing, and roof insulation, as well as fibers and nonwovens for commercial, industrial and residential applications. JM serves markets that include aerospace, automotive and transportation, air handling, appliance, HVAC, pipe and equipment, filtration, waterproofing, building, flooring, interiors and wind energy. In business since 1858, the Denver-based company has annual sales of approximately \$2.7 billion and holds leadership positions in many of the key markets that it serves. JM employs approximately 7,000 people and operates 44 manufacturing facilities in North America, Europe and China. JM's two manufacturing plants in California employ over 300. Additional information can be found at www.jm.com.

About Nest

Founded in 2010, Nest is dedicated to reinventing home products like the thermostat and smoke alarm, harnessing advanced technology to create a thoughtful home that takes care of the people inside it and helps address societal challenges like energy consumption, life safety, and home security. Nest products are sold in the United States, Canada, United Kingdom, Ireland, France, Belgium, and the Netherlands, and are installed in more than 120 countries. Nest is an Alphabet Inc. company and is based in Palo Alto, California.

Nest manufactures the Nest Learning Thermostat, a smart thermostat equipped with sensors (for example, temperature, humidity, and motion sensors), Wi-Fi capability, and processors running software to help customers consume less energy. The Nest Learning Thermostat combines inputs such as household temperature preferences (based on manual adjustments), occupancy patterns, and advanced algorithms to learn a household's temperature preferences, adjust the heating or cooling when the house is empty, and automatically lower air-conditioning runtime when humidity conditions permit, helping people lower their energy use without sacrificing comfort. Additional information can be found at www.nest.com.