AGENDA

UNIFORM BUILDING CODE COMMISSION
MECHANICAL ADVISORY COMMITTEE

May 12, 2015 2:00
Room 474
Heber M Wells Bldg
160 E 300 S Salt Lake City, UT

This agenda is subject to change up to 24 hours prior to the meeting.

ADMINISTRATIVE BUSINESS:

Sign attendance sheet

1. Approval of the minutes from the April 14, 2015 meeting

DISCUSSION ITEMS

2. Review amendment for IECC Section 403.2.9.1.3
3. Review amendment for IFGC Section 631.2
4. Complete review of IMC starting with Chapter 5 & IFGC
5. Begin review of 2015 IECC

Next Scheduled Meeting: June 9, 2015

If you do not plan on attending this meeting, please call Sharon at 530-6163 or email at ssmalley@utah.gov or dansjones@utah.gov.

In compliance with the Americans with Disabilities Act, individuals needing special accommodations (including auxiliary communicative aids and services) during this meeting should notify Dave Taylor, ADA Coordinator, at least three working days prior to the meeting. Division of Occupational and Professional Licensing, 160 East 300 South, Salt Lake City UT 84115, Phone 530-6628 or toll-free in Utah only 866-275-3675.

UNIFORM BUILDING CODE COMMISSION
MECHANICAL ADVISORY COMMITTEE

April 14, 2015
Heber M Wells Building Room 474
160 E 300 S
Salt Lake City, Utah
MINUTES

STAFF:
Dan S. Jones, Bureau Manager
Sharon Smalley, Board Secretary

MECHANICAL ADVISORY COMMITTEE:

David Wilson	Tyler Lewis
Trent Hunt	Brent Ursenbach
Dennis Thatcher	Roger Hamlet (excused)
Randy Beckstead (absent)	Kevin Bell (absent)

VISITORS:
Kevin Emerson, Utah Clean Energy

MINUTES	A motion was made by David Wilson to approve the minutes from the February 10, 2015 meeting as written. The motion was seconded by Trent Hunt and passed unanimously.
REVIEW AMENDMENT FOR IECC SECTION 403.2.9.1.3	Review of this section was tabled until the next meeting. Trent Hunt will prepare wording for review.
REVIEW AMENDMENT FOR IFGC SECTION 631.2	Review of this section was tabled until the next meeting.
COMPLETE REVIEW OF IMC & IFGC	Brent Ursenbach reported on his review of the 2015 IMC and pointed out the major changes from the 2012 to the 2015. He pointed out that many of these changes were for clarification and that this would make the intent of the code easier to understand. During the review, Brent asked that the committee look at the changes in Section 403 Mechanical Ventilation for the next meeting.
BEGIN REVIEW OF 2015 IECC	Kevin Emerson talked to the committee and reported that the Office of Energy Development has requested some cost effective analysis for the commercial and residential energy codes and was granted a technical analysis from the Department of

Energy. He will be provided these reports to the committee. The commercial report should be ready for review at the May meeting.

The meeting adjourned at 3:30.

Note: These minutes are not intended to be a verbatim transcript but are intended to record the significant features of the business conducted in this meeting. Discussed items are not necessarily shown in the chronological order they occurred.

Comments from David Brems, Principal, GSBS Architects and member of the Clean Air Action Team, to the UBCC Architectural Advisory Committee Encouraging the Adoption of the 2015 IECC in Utah

May 5, 2015

My name is David Brems, I am the Founding Principal of GSBS Architects, and a participant in the Governor's Clean Air Action Team. First I'd like to thank you for volunteering your time and expertise to review and assess the impacts of new building codes on Utah families, businesses, economy, and air quality. And thank you for allowing me to participate in today's meeting.

I'd like to talk to you today about why it is so important to update the residential and commercial construction codes to the 2015 International Energy Conservation Code, and how updating the code will benefit Utah's economy, families, businesses and our air quality.

1. **I have a copy of a letter for each of you signed by 16 members of the Governor's Clean Air Action Team encouraging you to consider the air quality benefits of adopting the 2015 IECC.** Before explaining why we think that updated energy codes are such an important air quality issue, we also wanted to make sure you know that updated energy codes were a unanimous recommendation of our group convened by Governor Herbert. The team, a diverse body including legislators, business representatives, experts and advocates, issued approximately 15 recommendations in October 2014 to the Utah Legislature and Governor Herbert, including: "Update the state building code to include the energy efficiency standards of the 2015 International Energy Conservation Code."[1]

   My hope is that the Architectural Advisory Committee will consider these important points as you review the 2015 IECC, and ultimately recommend its adoption to the Uniform Building Code Commission.

2. **I am going to spend most of my time talking about the many benefits the new code brings to Utah. But first, let's get to the elephant in the room - Does adopting the newer code increase construction costs?** Cost effectiveness analyses on the residential 2015 IECC and ASHRAE 90.1-2013 for commercial buildings are currently being developed by PNNL, so information is forthcoming.

   But, we know from a prior Utah-specific residential analysis of the 2012 IECC that updated energy codes generate positive cash flow in 2 years since energy cost savings are higher than potential increased mortgage costs.[2] In fact, recent analysis by the Building Codes Assistance Project found that

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[1] Envison Utah, Clean Air Action Team 2014/15 Policy Recommendations Released, October 2014, http://envisionutah.net/news-and-events/envision-utah-blog/item/329-clean-air-action-team-2014-15-policy-recommendations-released

[2] United States Department of Energy, *Utah Energy and Cost Savings for New Single– and Multifamily Homes: 2009 and 2012 IECC as Compared to the 2006 IECC*, April 2012, http://www.energycodes.gov/sites/default/files/documents/UtahResidentialCostEffectiveness.pdf

adopting the 2015 IECC for new homes in Utah will keep $1.07 billion in the pockets of Utah homeowners between 2017 and 2040.[3]

One thing that makes the residential 2015 IECC more cost effective than previous energy codes is the new Energy Rating Index performant path, which is a new, optional, performance path in the code. The Leading Builders of America supported the development of the ERI path and report that this new compliance path reduces the incremental cost to build a home to the 2015 IECC prescriptive requirements by $1,700.[4]

More fundamentally however, a recent analysis of California's Title 24 energy standard[5], found that contrary to industry claims, the energy efficient standards have no statistical impact on the construction cost of new homes. This study suggests that we should question claims that new homes built to the updated energy codes are too expensive for homebuyers.

3. **Next, we have to consider the timing of this review and your recommendation.** As you know, Utah's current energy code for new homes is already out-of-date and requires new homes to be built only somewhat better than the 2006 energy code. During the last legislative session, House Bill 285 would have changed Utah's building code adoption cycle for new single family homes from a three-year cycle to a six-year cycle. This legislation failed to pass last Session but will likely be proposed again in the upcoming 2016 Legislative Session, and if this bill were to be passed without the 2015 IECC first being adopted, an estimated 60,000 new homes would be built using the out-of-date standards until at least the year 2022.[6] The 2015 IECC should be adopted for new homes and commercial buildings prior to a six-year building code cycle taking effect. This is another reason why your recommendation to adopt the 2015 IECC this summer is critically important.

4. **Utah has much to gain by adopting the latest energy code to not take advantage of it. First and foremost, let's talk about air quality.** Air pollution is a top concern of Utah resident and businesses, and there is a direct connection between energy codes and improved air quality. Buildings are a growing contributor to Utah's air pollution, now contributing nearly 40% of the emissions that cause Utah's unhealthy air. This is data directly from the Utah Division of Air Quality.[7] Specifically, *inefficient* new buildings will increase energy consumption and needless NOx pollution, which is a precursor to PM 2.5. On the other hand, *energy efficient* new homes and commercial buildings provide a long-term tool to reduce air pollution by lowering energy consumption, thereby reducing the resulting pollution emissions over the 100+ year life of the structure.

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[3] Building Codes Assistance Project, *Utah Residential Energy Code Analysis: Impacts of Adopting the 2015 IECC in Utah* (2015) http://energycodesocean.org/sites/default/files/Utah2015Analysis.pdf

[4] RESNET, *Energy Rating Index Performance Path: Benefits of the Energy Rating Index Score Option*, April 2015, http://www.resnet.us/uploads/documents/EnergyRatings_FactSheet_EnergyRating_Index.pdf

[5] Report – New Home Cost v. Price Study, April 2015, http://www.slideshare.net/NehemiahStone1/construction-cost-v-home-price

[6] Estimate assumes that 10,000 housing units will be permitted per year, based historical data from United States Census Building Permit Survey, April 2015, http://www.census.gov/construction/bps/stateannual.html

[7] Utah Division of Air Quality presentation to Utah Clean Air Action Team, July 2014

As I said before – there is a direct link between energy code and air quality. Which is why last October, the Clean Air Action Team recommended to the Utah Legislature and Governor Herbert that Utah adopt the 2015 energy conservation code for new homes and buildings.

5. **Outside of air quality benefits, the new code has significant economic benefits as well, starting with keeping utility rates low across the board.** According to Rocky Mountain Power, growing electricity demand from new buildings in Utah is increasing the need to raise utility rates in order to build transmission lines and other utility infrastructure, which is paid for through higher utility rates for all homeowners and businesses. Building homes to current energy conservation standards keeps energy costs down for everyone.

6. **Before I close, I want to encourage you to keep in mind consumer.** Over the 50 to 100 year lifetime of any given home, it will have multiple owners and occupants who rely on the good judgment and common sense of the first builder to ensure their home isn't needlessly wasting energy and costing them money. It is a lot cheaper and easier to build-in efficiency to a home rather than having to spend thousands retrofitting inefficient home energy systems.

   According to a 2012 Conservation in the West poll 76% of Utah's voters say they would "require developers to meet updated standards to reduce energy waste and reduce home owners' utility bills, even if it increases the price of brand new homes by somewhere between one and eight thousand dollars." This opinion is held by a majority of voters in every geographic region (urban, suburban, rural), as well as majorities across the political spectrum.[8]

   Finally, According to a 2013 survey of Utahns conducted by Heart & Mind Strategies, "Improved energy efficiency in homes" ranked as the 2nd most important strategies to improve air quality in Utah after expanding public transit.[9] Utahns recognize that, as we reduce air pollution from vehicles, homes and buildings are the next priority.

   The Utah Legislature and Utah communities rely on your expertise and review to inform the Uniform Building Code Commission about which building and energy codes best serve the public interest. I and the others listed on this letter respectfully request that you consider the long-term air quality and financial impacts to Utah families and businesses during your review of the 2015 IECC, and encourage you to recommend its full adoption to the Uniform Building Code Commission. Thank you.

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[8] Public Opinion Strategies and Fairbank, Maslin, Maullin, Metz & Associates, *The 2012 Conservation in the West Poll*, January 2012, https://www.coloradocollege.edu/dotAsset/d1f0f33f-584a-47f7-bada-a34feb922fe8.pdf

[9] Heart & Mind Strategies, Utah Air Quality Quantitative Findings, September 25, 2013, http://envisionutah.net/news-and-events/envision-utah-blog/item/295-99-of-utahns-are-willing-to-take-personal-action-to-improve-air-quality

Envision Utah

Dear Governor Herbert, President Niederhauser, and Speaker Lockhart,

As you know, Utah's air quality is an issue that matters to everyone. While poor air quality during the winter ranks as Utahns' greatest concern about their quality of life, poor air quality during the summer is also becoming an issue. Our air quality affects our health and the health of our families. It also impacts our economy as we seek to recruit and retain businesses and a high-quality workforce.

On October 15, 2013, Governor Herbert asked Envision Utah to convene and facilitate the Clean Air Action Team. The individuals on the team represent a broad spectrum of interests and expertise in our community, including representatives from health care, business, nonprofit organizations, government, academia, transportation, and others. This independent Team was tasked with working to provide a set of broadly supported recommendations to improve our air quality.

The Team was asked to work throughout 2014 to provide recommendations. At the beginning of 2014 the Clean Air Action Team recommended several interim strategies. These and other strategies have been refined over the past year to comprise a set of comprehensive recommendations that will significantly improve Utah's air quality in the winter and summer. These recommendations are intended to complement and add to the actions proposed in the current State Implementation Plan process.

We encourage policymakers, businesses, and individuals to study and implement the recommendations of the Clean Air Action Team.

Sincerely,

Lonnie Bullard
Chairman
Jacobsen Construction
Team Co-Chair

Michelle Hofmann, MD, MPH
Medical Director
Riverton Hospital's Children's Unit
Team Co-Chair

Robert Grow
President and CEO
Envision Utah
Team Facilitator

YOUR FUTURE
ENVISION UTAH

Envision Utah

Clean Air Action Team Recommendations

Poor air quality during certain periods of the year ranks as Utahns' greatest concern about their quality of life, and it threatens not only our health but our economy as we seek to recruit and retain businesses and a high-quality workforce.

On October 15, 2013, Governor Gary Herbert asked Envision Utah to convene and facilitate the Clean Air Action Team, which includes representatives from health care, business, nonprofit organizations, government, academia, transportation, and more. This independent team was tasked with working to provide a set of broadly supported recommendations to improve our air quality.

The team's consensus recommendations are set forth below. Combined with the controls that are already being put into place through the state's State Implementation Plan efforts, these recommendations will make a substantial difference in the amount of emissions we put into our air. Moreover, the projected cost to Utahns is fairly minimal (see Figure 2).

With about half of our emissions coming from automobiles and another 40% coming from buildings and other "area sources," most of our air pollution originates from our own cars, homes, and businesses. These recommendations target those emission sources, with particular emphasis on strategies that (1) result in substantial reductions in emissions, and (2) require relatively little expense. With concerted action, together we can clean our air.

As Utah's population continues to grow, these actions become even more imperative. By 2050, the Governor's Office of Management and Budget estimates that the state's population will nearly double. In our urban areas where air quality is a challenge, that translates to roughly doubling the number of miles we drive and the number of buildings that need to be heated. To improve our air quality, we will need to significantly reduce the amount of pollution each person produces.

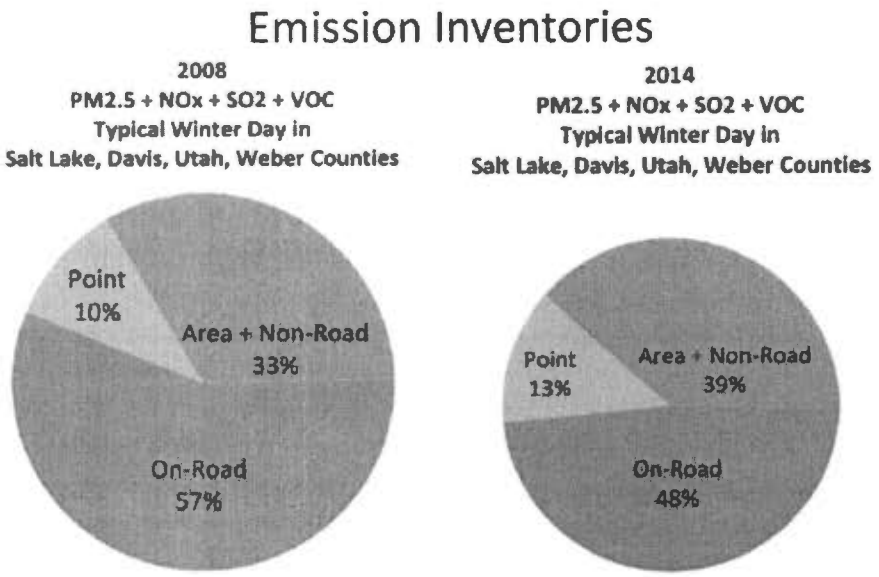

Figure 1. Source: Utah Division of Air Quality

Summary of Recommendations

1. Ensure Utahns have access to low-sulfur Tier 3 fuel as soon as possible.
2. Accelerate the transition to cleaner Tier 3 cars. If all cars and fuel were Tier 3 by 2050 we would remove approximately 62% of mobile emissions per day from our air.
3. Reduce the amount of wood burning that occurs during inversion periods. Eliminating residential wood burning would decrease daily area source emissions by about 5% in 2050.
4. Invest additional resources in public transportation and facilities that make "active transportation" modes like biking and walking more convenient. By 2050, if we reduce the number of miles driven per capita by 10% we would reduce daily mobile emissions by roughly 8%.
5. Allow the Air Quality Board and Division of Air Quality to adopt rules that are more stringent than federal regulations and continue to give the Division of Air Quality sufficient budget to continue effectively achieving its mission.
6. Adopt a rule to require suppliers to sell only ultra-low NOx water heaters. Replacing all water heaters with ultra-low NOx models would reduce daily area emissions by about 5.3% in 2050.
7. Increase the energy efficiency of our existing and new buildings. Increasing the efficiency of existing buildings could reduce area source emissions by about 1.7%. Increasing new building efficiency by 50% would eliminate approximately 2.4% of our area source emissions by 2050.
8. Continue current efforts to reduce emissions from the oil & gas operations within the Uintah Basin.

Strategy	Annual Cost Per Household
Tier 3 Cars and Fuel	$ 11
Eliminate Wood Burning	$ -
Ultra-Low NOx Water Heaters	$ -
Improve Energy Efficiency of All Older Buildings	$169
Improve Energy Efficiency of All New Buildings by 50%	Net savings of $95

Figure 2. Source: US EPA, Utah Division of Air Quality, and Utah Clean Energy

How Our Pollution is Formed

In Utah's urban areas, wintertime particle pollution creates the greatest air quality concerns. Particle pollution (also called particulate matter or PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope. The particles that cause the most concern to Utahns in the winter are commonly referred to as PM2.5, meaning that each particle is 2.5 micrometers or smaller in size, or significantly smaller than the diameter of a human hair.

While some of our PM2.5 is put into the air directly from things like wood burning and cars, much of it is formed in the air through chemical reactions. The two types of emissions that contribute most to these reactions are NOx (Nitrogen Oxides) and VOCs (Volatile Organic Compounds). Most NOx is produced from burning fossil fuels. VOCs are emitted as gases from certain solids or liquids. Organic chemicals are widely used as ingredients in household products. Paints, varnishes, and wax all contain organic solvents, as do many cleaning, disinfecting, cosmetic, degreasing, and hobby products. Fuels are made up of organic chemicals. All of these products can release organic compounds while you are using them, and, to some degree, when they are stored.

Ozone pollution can also be a concern in Utah's urban areas during the summer months, or in the Uintah Basin during the winter. Ozone (O3) naturally occurs high in our atmosphere, where it blocks harmful ultraviolet rays from reaching earth's surface. In contrast, ozone in the lower atmosphere is unnatural and harmful to health. VOC and NOx emissions, combined with heat and sunlight, allow for chemical reactions that produce ozone. The summers in Utah create a perfect environment to produce high levels of ozone in the lower atmosphere.

Reducing our PM2.5 emissions results in a direct improvement in our air quality and a direct reduction in the PM2.5 that we breathe. Reductions in gases like NOx and VOCs also reduce the PM2.5 and ozone that we breathe. Reducing NOx and VOC emissions will improve our air in the winter and summer. As a result, while the discussion herein primarily focuses on wintertime emissions, the recommended strategies will also reduce summertime ozone pollution.

Vehicles and Fuel

Vehicles make up approximately half of local emissions, a proportion that is decreasing as older cars are phased out and newer, cleaner cars are phased in (see Figure 1). Reductions in the pollution emitted by our cars–through "Tier 3" cars and fuel–are projected to have a significantly greater impact in emissions reductions than any other strategy.

Tier 3 refers to an integrated system of vehicle and fuel standards nationwide that the EPA has adopted to replace the prior Tier 2 standards. The standards are being phased in from model year 2017 to model year 2025. With both the vehicles and fuel working together, the Tier 3 standards will reduce volatile organic compounds (VOC) and nitrogen oxides (NO_x) emissions by 80% on a fleet average basis and direct particulate emissions by 70% on a per vehicle basis. These reductions are achieved through improved vehicle emissions standards and by reducing the amount of sulfur in fuel from an average of 30 ppm to 10 ppm. The low-sulfur fuel is important because sulfur reduces the effectiveness of the advanced pollution control equipment in the vehicles.

The greatest short-term benefit comes from lower-sulfur fuel, because using it would reduce emissions even in the cars we drive today. Tier 3 standards are projected to reduce total NO_x emissions by 10% and total VOC emissions by 2.8% in 2018, primarily due to lower-sulfur fuel, assuming such fuel is available in Utah. As more people buy the cleaner cars, Tier 3 cars will provide an even greater benefit over time, resulting in reductions by 2030 of total NO_x emissions by 24.7% and total VOC emissions by 15.5%. Under Tier 3 standards, there is no place in the US that stands to benefit as much as Utah, with 7 counties projected to have some of the largest 24-hour fine particulate improvements in the US relative to all other US counties (Figure 3).

Tier 3 cars are projected to cost on average $72 more than current Tier 2 cars. Tier 3 gasoline standards are estimated by the EPA to increase the cost of gasoline by less than a penny per gallon on a national basis. The actual cost to produce the cleaner fuels in Utah is unknown.

The EPA has adopted Tier 3 for phase-in beginning in model year 2017. Utah's refineries would likely have several years to comply after that date, and many will not actually be required to produce or sell Tier 3 fuels in Utah at any date. The EPA's proposed fuel standards include an "averaging, banking, and trading" system that allows refiners and importers to spread out their investments, which means they would only need to meet a nationwide average to satisfy the fuel standards; if a large gasoline producer decides to produce cleaner fuel in another state, it may be able to average that out by producing fuel that is not as clean in Utah. The Clean Air Act also contains provisions that generally prevent an individual state like Utah from adopting its own fuel standards.

Without the lower-sulfur fuel, a significant portion of the emissions reductions from Tier 3 cars will not occur because sulfur from the fuel "fouls" the emissions control equipment and causes it to function sub-optimally.

Recommendation 1: Work with the applicable refineries to ensure Utahns have access to low-sulfur fuel as soon as possible. Most of the fuel sold in Utah is produced by a handful of refineries in Utah and Wyoming. While a few of these refineries will be required to produce fuel below 10 parts per million sulfur, others can average out their sulfur content with refineries elsewhere. Working with these refineries to ensure Utahns can buy lower-sulfur fuel is critical to improving our air quality, in both the short- and the long-term.

Recommendation 2: Accelerate the sale and purchase of cleaner cars in Utah even sooner than model year 2017 through public education and other means. These cars are already being manufactured and sold in the United States; a car with a smog rating of 8 or higher generally meets Tier 3 emission standards. (Smog ratings run from 1 to 10, with 10 being the cleanest. Smog ratings for all new cars are shown on the window stickers.) To encourage

those who buy cars between now and 2017 to purchase cleaner cars, educational efforts are needed, as well as conversations with auto dealers. Incentives should also be considered.

Reductions in PM2.5 Due to Tier 3 in 2030 by County

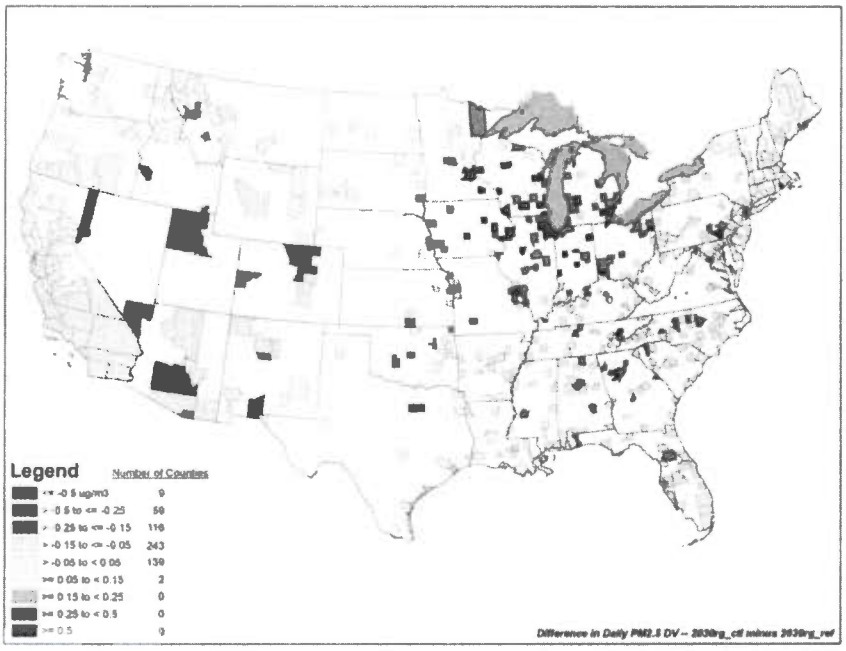

Figure 3. Source: United States Environmental Protection Agency

Wood Burning

Wood burning has a large impact on air quality. Along the Wasatch Front, it may contribute somewhere between 5 and 15% of total direct fine particulate matter emissions during inversions. While we also experience a significant amount of additional particulate pollution that is formed through chemical reactions in the atmosphere, reducing direct emissions of particulates has a direct benefit. Based on EPA emission factors, heating one home with a wood burning stove as a sole heating source is equivalent to 200 homes heated with natural gas in terms of direct fine particulate and 500 homes in terms of volatile organic compounds.[1] Not only does wood burning have implications for poor air quality in the ambient air shed, it also has health implications for air quality within the homes in which the wood burning occurs.

[1] Kelly, Kerry et al. "Contribution of Woodsmoke to $PM_{2.5}$ During Wasatch Front Inversions." PowerPoint presentation. Salt Lake City, UT. 15 Jan 2014.

Since the Clean Air Action Team issued its preliminary recommendations in January 2014, significant progress has been made on this issue. The standard has been changed so that burning will be restricted earlier in an inversion when poor air quality is forecast. The list of homes registered as having wood burning as their sole source of heat - and therefore as being able to burn even on restricted days - is being shortened, and money has been appropriated to convert these homes to other forms of heating.

The extent to which wood burning occurs in homes, other than those that are registered as sole-source homes, or in commercial establishments, is not fully known, but it is estimated that sole source homes account for only a fraction of the emissions due to wood burning.

Recommendation 1: Continue to reduce the need for a "sole source" exemption to wood burning restrictions, with the goal of eventually eliminating the exemption. This may require additional funding to replace wood burning stoves and fireplaces with other heating sources in those homes that are currently registered as sole source. Eliminating the exemption would improve air quality and simplify enforcement of wood burning restrictions.

Recommendation 2: Increase the enforcement of wood burning restrictions. Increased enforcement could take the form of additional inspectors as well as increased fines. In addition, phone numbers and other methods for reporting violations should be simplified and widely publicized, such that it is easy for people to report violations and reports result in swift action.

Recommendation 3: Provide widespread public education about the air quality and health impacts of wood burning. Much is already being done on this front, and these efforts need to be continued and enhanced.

Reducing Driving Through Public and Active Transportation

Our roads are already congested with traffic. As the population continues to grow, how will our transportation infrastructure handle the increase in cars? Reducing average personal vehicle miles traveled per day will reduce emissions; one of the best ways to clear the air is to take cars off the road. When a cold engine is started it takes a couple minutes for the "emissions control equipment" to warm up and function efficiently. About 24% of daily vehicle emissions come from the first few minutes of driving, from the "cold start." Shifting trips from cars to public transportation, walking, bicycling, and carpooling would reduce the number of cold starts.

In addition, shifting trips away from cars–or even shortening the trips we drive–will reduce traffic congestion. This has significant benefits for air quality, and it also improves our quality of life and reduces the amount of money we need to spend on roadway infrastructure.

How can we accomplish this? One key is to make travel by modes other than the automobile more convenient. This involves investing in infrastructure and equipment for public transportation and "active transportation" like biking and walking.

Recommendation 1: Invest additional resources in public transportation. Currently, public transportation replaces 120,000 car trips each day and carries 25% of commuters to downtown Salt Lake City. According to the Utah Transit Authority, this eliminates 2,000 tons of emissions each year, and an additional ¼ cent sales tax for public transportation could expand service in a way that would immediately increase ridership by over 50%, and by almost 90% within five years, resulting in an annual emissions reduction of 3,600 tons.

Recommendation 2: Invest additional resources in facilities that make "active transportation" modes like biking and walking more convenient. These facilities could include trails, sidewalks, bike lanes, "wayfinding," pedestrian safety investments, and other infrastructure. Particularly important is improving the convenience of biking and walking in proximity to passenger rail and bus rapid transit stations.

Grant Sufficient Budget and Authority to the Division of Air Quality and the Air Quality Board

Increased budget and authority would allow the Division of Air Quality to more effectively take action to clean the air. The Division could use the funding to increase research and analysis, enforcement, and public education. Added authority would enable effective regulation and enforcement.

Recommendation 1: Allow the Air Quality Board and Division of Air Quality to adopt rules that are more stringent than federal regulations. Utah problems require Utah solutions, not one-size-fits-all federal mandates. Because of our unique geography and climate conditions, Utah may need to adopt solutions unique to Utah, where such solutions are cost-effective (or cost-free) and make sense.

Recommendation 2: Continue to give the Division of Air Quality sufficient budget to continue to effectively achieve its mission. Recently, additional funding has been provided to DAQ for research and other activities, and this increased funding level should continue.

Ultra-Low NOx Water Heaters

Burning natural gas in homes, whether in furnaces, water heaters, or other appliances, produces nitrogen oxides (NOx), which react with other gases in the air to form particulate matter. Water heaters make up approximately 45% of a building's emissions. Ultra-low NOx

water heaters emit 70% less NOx than their counterparts. If every water heater were replaced with the ultra-low NOx variety, building emissions would be reduced by about 37%. The average life of a water heater is 7 years, and it is estimated that within 10 years almost all our water heaters could be ultra-low NOx models. Although ultra-low NOx water heaters do not increase energy efficiency, they do not cost more to manufacture than standard water heaters, and it is estimated that if the demand for ultra-low NOx water heaters in Utah increased this product would be brought to local stores, making the cost and availability comparable to what Utahns experience today with standard water heaters.

Recommendation: Adopt a rule to require suppliers to sell only ultra-low NOx water heaters as of a date 2-3 years in the future, to allow suppliers to move out their current inventories of water heaters. This rule would be adopted by the Air Quality Board.

Existing Building Energy Efficiency Improvements

In Utah's urban areas where air quality is an issue, there are about 750,000 buildings (both homes and businesses), and the emissions from natural gas heating produce about 12 tons of emissions on a typical winter day. Retrofitting residential homes can increase their energy efficiency by approximately 30%, which would subsequently decrease emissions by 30% and save homeowners on utility costs. Improvements may include improving weather stripping, adding or upgrading insulation, upgrading windows, replacing furnaces, or other actions. Average costs for retrofits of residential homes are approximately $5,000. Retrofitting multi-family buildings and businesses can increase efficiency by 12.5% to 15.8% depending on the measures taken. Some of the measures that can increase a building's efficiency include retrocommissioning, energy audits, lighting upgrades, and upgraded equipment. The average cost for these commercial building improvements varies depending on the measures implemented. Actions such as retrocommissioning and energy audits are relatively inexpensive and have a payback period of less than one year. Upgrading heating and cooling equipment has a larger effect on a building's efficiency but also has a longer payback period of five or more years. The sooner these buildings become more efficient the sooner our emissions will be reduced.

Recommendation 1: Amend the State Code to include enabling legislation for Residential PACE programs to finance home energy efficiency improvements. PACE is a financing program to help with the upfront cost of energy efficiency improvements and renewable energy measures. Local governments provide loans to home owners who would like to improve the energy efficiency of their home; these loans are paid back through property assessments. The annual utility savings are greater than the annual payments would be under a PACE program, making building improvements completely affordable. In 2013, Senate Bill 221 authorized local governments to adopt PACE for commercial buildings in Utah; we

recommend amending this bill to also include PACE for homes and other residential buildings.

Recommendation 2: Educate the public about existing energy efficiency financing programs and expand these programs. For example, Questar's Thermwise and Rocky Mountain Power's Wattsmart programs provide rebates to home builders, businesses, and homeowners for a plethora of qualifying energy efficiency improvement efforts. Their websites outline the specific options including choosing to build more efficient, upgrading appliances, replace windows and insulation, or simply downsize energy use. Wattsmart provides free weatherization services to income-qualifying home owners; Thermwise has Home Energy Plans and Personalized Energy Comparison Reports readily available on their website. The more widespread this information becomes, the more people will opt to retrofit their homes.

New Building Construction

By 2050 Utah's air quality-challenged urban areas are projected to have nearly 800,000 new buildings. As we more than double the number of buildings in these areas, nitrogen oxide (NOx) emissions from area sources will become a larger portion of the overall emissions. Improving the energy efficiency of new buildings will decrease these emissions as well as save on energy use. The technology and designs are readily available. Every building that is built to a higher energy standard today is a building that won't need to be retrofitted later.

Recommendation 1: Update the state building code to include the energy efficiency standards of the 2015 International Energy Conservation Code. This would increase new home energy efficiency by close to 50%. On average, building to the 2015 code adds around $10,000 to building costs for a single family home. Accounting for the increase in monthly mortgage payments and the decrease in monthly utility bills the average annual savings would be about $12.

Recommendation 2: Require that a Home Energy Rating System (HERS) score be included in MLS listings. HERS is a nationally recognized system that sends certified home energy raters to inspect and calculate a home's energy performance. The U.S. Department of Energy has established the average resale score at 130 HERS. The more efficient a home is, the lower HERS score it will have. Lower scores also allow for a higher resell price on a home. HERS teaches homeowners and builders how to analyze and improve energy efficiency and thus the value of a home. Multiple Listing Service (MLS) is a free, national search engine for finding real estate for sale by realtors. Showing a HERS rating on MLS would allow energy efficiency to be factored into a home's value, providing information to prospective purchasers and facilitating free market responses to improve energy efficiency.

Uintah Basin

While ozone is typically a summertime problem in urban areas, the Uintah Basin experiences increased ozone levels in the winter. Most of the emissions that cause elevated ozone levels are associated with oil and gas operations on public, private, and tribal lands in the area. The majority of the oil and gas emissions contributing to ozone are from oil tanks and pneumatic devices and pumps.

In order to improve air quality in the Uintah Basin, we express support for continued and enhanced efforts, working closely with stakeholders in the Uintah Basin.

Recommendation 1: Continue current efforts to regulate emissions from the oil & gas industries within the Uintah Basin on lands over which the state can exercise jurisdiction. This includes Rule UAC R307-401-19, which allows for quicker approvals in exchange for agreement on stricter standards and compliance. We also express support for the following four proposed rules that, if approved, would improve air quality in the Uintah Basin.

> **R307-501,** which establishes general requirements for emission prevention and good air pollution control practices for all oil and gas exploration and production operations, well production facilities, natural gas compressor stations, and natural gas processing plants.
> **R307-502,** whose purpose is to reduce emissions of volatile organic compounds from pneumatic controllers that are associated with oil and gas operations by requiring existing pneumatic controllers to meet the Federal standards established for new controllers.
> **R307-503,** which establishes conditions to ensure that combustion devices used in the oil and gas industry are operated effectively.
> **R307-504,** which establishes control requirements for the loading of liquids containing volatile organic compounds at oil or gas well sites.

Recommendation 2: Continue collaborating with and supporting tribal and Federal jurisdictions to reduce emissions on tribal lands in the Uintah Basin.

Recommendation 3: Continue to work with private industry to reduce emissions from oil & gas operations on public, private, and tribal lands in the Uintah Basin.

About the Clean Air Action Team

On October 15, 2013, Governor Gary Herbert announced that he was asking Envision Utah to convene and facilitate the efforts of a Clean Air Action Team. The Action Team includes representatives from health care, business, nonprofit organizations, government, academia, transportation, and more. This independent team was tasked with working to provide a set of broadly supported recommendations to improve our air quality. These recommendations

can then be implemented by government, businesses, and individuals. It is the broadest group ever assembled in Utah to evaluate strategies and develop a holistic approach to solving our air quality issues. All ideas were on the table for evaluation.

Clean Air Action Team members:

- Lonnie Bullard, Jacobsen Construction (co-chair)
- Dr. Michelle Hofmann, Physician, Breathe Utah, University of Utah (co-chair)
- Stuart Adams, State Senator
- Patrice Arent, State Representative
- Ralph Becker, Mayor Salt Lake City
- David Brems, GSBS Architects
- Rebecca Chavez-Houck, State Representative
- Jeff Edwards, Executive Director, Economic Development Corporation of Utah
- Robin Erickson, Utah Clean Cities
- Ryan Evans, Salt Lake Chamber
- Matthew Eyring, Chief Strategy and Innovation Officer, Vivint Inc.
- Dr. Robert Gillies, State Climatologist
- Andrew Gruber, Executive Director, Wasatch Front Regional Council
- Susan Hardy, Mountainland Association of Governments
- Roger Jackson, FFKR Architects
- Ron Jibson, President and CEO, Questar
- Linda Johnson, Citizen
- Terry Marasco, Executive Director, Utah Moms for Clean Air
- Alan Matheson, State Planning Coordinator and Governor's Environmental Advisor
- Ben McAdams, Mayor Salt Lake County
- Nancy McCormick, State President, AARP
- Dr. Robert Paine, Pulmonologist, Program on Air Quality, Health, & Society, University of Utah
- Angelo Papastamos, UDOT Travelwise
- Dr. Edward Redd, State Representative and physician
- Dr. Bob Rolfs, Deputy Director, Utah Department of Health
- Steve Sands, Kennecott, Air Quality Board
- Joseph Shaffer, Director of Health, Tri-County Health, Uintah Basin
- Matt Sibul, Utah Transit Authority
- Amanda Smith, Executive Director, Dept. of Environmental Quality
- Lowry Snow, State Representative
- Dr. Charles Sorenson, CEO, Intermountain Health Care
- Peter Stempel, Stempel Form Architects
- Cody Stewart, Governor's Energy Advisor
- Kathy Van Dame, Air Quality Board
- Vicki Varela, Director, Utah Office of Tourism
- Ted Wilson, Executive Director, UCAIR
- Sarah Wright, Executive Director, Utah Clean Energy

About Envision Utah

Envision Utah is a non-profit, nonpartisan organization committed to exploring the challenges and opportunities of growth in Utah. We engage people to create and sustain communities that are beautiful, prosperous, healthy and neighbourly for current and future residents. With the right vision, we can accommodate Utah's growing economy and increasing population without sacrificing the incredible quality of life that makes Utah great.

In 1997, Envision Utah launched an unprecedented public effort that brought together residents, elected officials, developers, conservationists, business leaders, and other interested parties to make informed decisions about how we should grow. Through a historic series of workshops and surveys, Envision Utah helped lay the groundwork for actions including:

- Development of TRAX and Frontrunner to add 140 miles of light rail, streetcar and commuter rail to Utah
- Creation of innovative housing and commercial projects like Daybreak and City Creek
- Dramatically slowing the rate of development of Utah's lands to preserve more open space for agriculture and recreation
- Decreasing household water consumption by 25%
- Decreasing our emissions by 47% among all pollutants
- Saving billions in reduced infrastructure costs

With Utah's population projected to grow by 2.5 million in the next three decades, Envision Utah is making history again with the Your Utah Your Future project, a statewide process that invites the public to get involved and decide how Utah will grow. Governor Herbert kicked the effort off in October 2013 and will kick off the public involvement effort this fall. The Clean Air Action Team is one element of the Your Utah, Your Future process.

Learn more at www.envisionutah.org.