

## Energy & Environment Working Group Proceedings

PNWER Annual Summit – Whistler, British Columbia

July 22nd, 2014

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Co-Chair Rep. George Eskridge, Idaho Legislature

Co-Chair Paul Manson, President & CEO, Sea Breeze Power Corp

### **Speakers**

Rep. Jeff Morris, Washington State Legislature & Project Director of Legislative Energy Horizon Institute

Rob Bernhardt, Project Manager, Bernhardt Contracting

Andrew Pape-Salmon, P.Eng., MRM, Senior Specialist – Energy, RDH Building Engineering Ltd.

Tony Usibelli, Director, Washington State Energy Office, Department of Commerce

Jim Ogsbury, Executive Director, Western Governors' Association

Pam Barrow, J.D., Director, Energy & Sustainability, Northwest Food Processors Association

Robert Greenwald, P.Eng, MBA, President, Prism Engineering

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Rep. George Eskridge began the session by emphasizing that energy efficiency and conservation has a significant role in providing the energy needs of the future, as well as keeping the costs down.

Paul Manson further expanded on the importance of energy efficiency, and highlighted some recent innovations. He stressed that the more efficient we are with our resources, the more resilient our economy will become. He also clarified that energy efficiency is a technological, not behavioral solution. It is much easier to make the technology more efficient than it is to try to change people's behavior to conserve more energy. In Germany, energy efficiency measures in buildings, such as double paned windows, are now standard. LED lighting, piped in natural light, High Voltage Direct Current (HVDC) transmission lines and optimization of industrial power use are other innovations that are starting to gain traction. He concluded by inviting the

attendees to participate in the PNWER initiative, led by Andrew Pape-Salmon, to create a roadmap to Net Zero Construction by 2030.

### **Setting the Stage: Why is energy efficiency important?**

Representative Jeff Morris further explained the economic necessity of energy efficiency as increasing competitiveness in the increasingly global marketplace. The U.S. was behind in terms of energy efficiency. California and Washington both recently banned specific home appliances that were known to be excessively inefficient. When you look at the life cycle costs, energy efficiency becomes more important – it is clearly the low hanging fruit. However, utilities are not currently set up to appropriately value a reduction in energy needed. Currently they only value adding capacity, not removing it. Utilities need to monetize taking capacity off the grid. They also need the ability to turn on pumps when there's excess wind energy – this would be a major efficiency gain for the state and consumers.

### **Energy Efficient Buildings**

#### ***Contractor's view: why choose Passive House?***

Rob Bernhart began his presentation by explaining what Passive House was. It is a building standard focused on energy efficiency. In order to obtain the designation you must be below the max energy usage for Passive Houses, which is a fraction of that used by code. However, the standard is flexible in that it does not tell you how to meet the required level of energy efficiency. In Europe Passive House is increasingly common, and the European Union has even decided that by 2020 Passive House will be the new building code. Passive Houses are a low cost, high efficiency option. Small changes to a house typically increase costs, but with a passive house the changes are so major, that they allow you to completely remove costly mechanical systems which are no longer needed, thereby reducing the overall cost.

Rob Bernhart then moved on to describe the Passive Houses in more detail and provided examples both from Europe and here in BC. Passive Houses are preferred by occupants – they notice the increase in comfort from fresher air and no temperature swings. Indoor air quality is unparalleled. They also work for any use or climate: examples were shown for a high rise office tower in Vienna, a municipal building in Austria, townhouse building in Victoria, BC, and a recreation day lodge and a duplex in Whistler, BC. The design changes depending on the climate; in a hot climate the design would focus on cooling the house, not heating it.

Rob Bernhart moved on to detail the technology more, and emphasised that Passive Houses tended to be more affordable than code houses. The focus of passive house design is on the envelope, not the technology inside the house. The design is thoughtful and detailed, it is quieter than other homes, has superior ventilation, thermal performance, and high quality

components. There are reduced expenses on mechanical systems, energy and maintenance, which when compared to current code buildings, tend to make them more affordable. For a particular house in Victoria, BC, Rob Bernhart indicated that the higher cost of the mortgage payment (\$134/mo more), was more than offset by the lower energy and maintenance costs, resulting in the Passive House being \$50/month cheaper than a code house.

Rob Bernhart concluded by describing opportunities for both business and government, and how to support the shift towards more energy efficient buildings. PNWER's mix of government and business could help influence when a higher standard of building is implemented. The standard will become common when legislators decide it should be. In addition, creating energy labelling for buildings could help create a market for energy efficient buildings. Local government can offer incentives through taxation and permitting, while the provincial and federal governments can offer research support and other incentives.

### ***Deep Energy Retrofit of a High-Rise Multifamily Building***

Andrew Pape-Salmon began his talk by describing the importance of retrofitting existing buildings, as 70% of all buildings that will be present in 2030 exist today. He moved on to emphasise that in many cases the low hanging fruit has already been picked. The next step is a Deep Energy Retrofit, which is a single major overhaul of a building. Through one major investment, there's improved occupant comfort from better temperature control, indoor air quality and better sound proofing, along with increased building durability and resale value.

Andrew Pape-Salmon then described a case study of a 13 story multifamily building in Vancouver called The Belmont. The building was undergoing a major renewal focused on occupant comfort, maintenance concerns, and resale value, and the strata decided to piggyback an energy efficiency component onto it. The renewal cost \$3.6 million and was completed over a 9 month period, primarily focused on the exterior of the building. Adding energy efficiency added 2% more to the cost of the project. The strata had a public vote on whether or not to add the energy efficiency component. It was suggested that if the vote had been anonymous, the energy efficiency measure would likely not have been approved. The behavioral element is very important.

### ***The role of states in promoting energy efficiency***

Tony Usibelli started by stating that the role of the State is critical in promoting energy efficiency, and then described 5 areas where States could have a more active role. First, the government should get their own house in order. They are a major landlord and consumer of energy. They should be building more efficient buildings, retrofitting existing ones, and ensuring they aren't spending public money through inefficiency. Second, the government should establish standards for the built environment that promote energy efficiency. Third, the

utilities and electricity sector in general is highly regulated, if not owned, by the State. There is an opportunity for the utilities to become a major player in energy efficiency. Fourth, use the role of the States in implementing environmental regulations to increase the emphasis on energy efficiency. Each State has mandated emissions reductions under the Clean Air Act, and energy efficiency could play a significant role in meeting those reductions. Fifth, the government can use financial incentives (through taxation, low income funding, or cash incentives), to increase energy efficiency while also promoting job creation.

Jim Ogsbury began by describing the Western Governors' Association (WGA) and their policies around energy efficiency. The WGA is a bipartisan organization that represents the governors of the 19 westernmost States. They develop public policy and best practices for the region. Last year they created a 10 year Energy Vision with the goal of satisfying all energy needs for the region from reliable N.A. resources. The Energy Vision has been adopted as official policy, and includes a focus on energy efficiency. It can be downloaded at [www.westgov.org](http://www.westgov.org). Jim Ogsbury then concluded by affirming that energy efficiency will play a key role in helping States meet the mandated GHG emissions targets set out in the new Clean Air Act.

### **Industrial Energy Efficiency**

#### ***Discussion of approaches and activities to promote and achieve industrial energy efficiency***

Pam Barrow began her talk by stating that there was lots of opportunity for energy efficiency in industry, and that additionally it was also very important for global competitiveness. The Northwest Food Processors Association (NWFPA) has been around for 100 years. Food processing is the 3<sup>rd</sup> largest manufacturing sector in the US, and the NWFPA has over 450 members, 136 companies, and is the 2<sup>nd</sup> largest user of electricity in the Northwest. NWFPA has focused on energy efficiency for a number of reasons: it's vital to business as it impacts the bottom line, energy prices are volatile and rising, energy is the single most "uncontrolled" expense at a plant, it often accounts for 90% of GHG emissions, customers want green and sustainable products, and lastly, there are Utility and Government incentives to help with the energy efficiency projects.

Pam Barrow continued by describing the NWFPA's Energy Goal from January 2009 and how they progressed towards it. The goal was to reduce energy intensity by 25% in 10 years, and 50% in 20 years through innovation, new technology and new resources. However, every plant is different, so mandating a specific approach for the industry was very difficult. They realized that in order to have a successful program they had to address the barriers to energy efficiency. They discovered that staff time was the top barrier. No one person was entirely focused on energy efficiency. They realized that Government programs could assist with the staff load. Another barrier was the cost – financial incentives helped drop costs within an acceptable 2

year payback time. Other issues were optimizing scheduling to minimize plant shut downs, and providing the training and assistance to implement the energy efficiency programs.

Pam Barrow explained how the NWFPA addressed many of these issues through an innovative pilot program with the local Utility. The Utility had started an Energy Manager program, where the utility paid half the cost of a full time Energy Manger. However, to qualify the company needed 1 Million KW in savings – essentially excluding smaller companies from the program. NWFPA approached the Utility to do a pilot program where they would aggregate a number of small companies, and share the Energy Manger between them. They selected 7 food processing companies, and created a collaborative cohort of representatives from each company. They were provided with training, tools and methodologies, and met regularly to share their peer-peer learnings and best practices. More progress was made through this group approach than the companies could have made on their own. The program was highly successful and reached its 12 month target of 1.3 Million KW hours within only 8 months. In total, the group has achieved 7.6 Million KW hours total savings. This program has now been implemented across the industry, leading to a 9% drop in energy intensity; NWFPA is on track to achieving its 25% energy intensity reduction goal. For more information please visit the NWFPA website at [www.nwfpa.org](http://www.nwfpa.org).

### ***Strategic Energy Management applied to industry: Case study of New Afton Gold Mine***

Robert Greenwald began by describing his company, Prism Engineering, an energy efficiency engineering firm with 35 staff. Prism often works with the mining sector and also serves as a coach to these companies' BC Hydro Energy Managers. Robert Greenwald then proceeded to give an overview of Strategic Energy Management. Strategic Energy Management is a continuous improvement standard. The process begins by evaluating the current situation, implementing both technical and training-based / behavior changing projects, followed by reviewing and improving the energy management progress.

Robert Greenwald then provided a case study of New Afton Gold Mine, owned by New Gold. Their 1<sup>st</sup> step was to create an energy policy – they made a commitment to manage energy as efficiently as possible, continually improve energy performance, and utilize resources as responsibly as possible. They became the first mine site in North America to achieve the ISO 50001 Energy Management standard. The standard became a vehicle for achieving their energy vision, and helped them evaluate themselves against best practices in the industry. An example of one of the technical projects they conducted was turning off the conveyor belts when not in use. The current motors did not allow this, so they had to be replaced. Turning the conveyor off while not in use is now saving them \$12,000 / month in energy savings. In addition, their technical program successes went hand in hand with people-based programs, training and

engagement. The New Afton Gold Mine now has an Annual Energy Review to continuously look for ways to improve.

[www.prismengineering.com/resources/presentations](http://www.prismengineering.com/resources/presentations)

### **Roadmap to Net Zero Construction and Deep Energy Retrofits by 2030**

Andrew Pape-Salmon indicated that there wasn't enough time left to go through his 30 minute presentation on the Roadmap to Net Zero Construction and Deep Energy Retrofits by 2030, but that it would be up on the PNWER website after the Summit. He gave a brief overview of the Roadmap, starting with the need to clarify PNWER's scope, and facilitate consensus on key policy direction. He also touched on building upon best practices in the region such as the Senate Bill in Washington State that transformed the market in 2009. This policy could be replicated in other regions. The group would also need to identify funding for further research and analysis, with the goal of commissioning a white paper in time for PNWER Summit in Montana next year. Other initiatives include energy benchmarking of existing buildings, creating a Two Tier Energy Standard for new construction (so you can apply for incentives to strive for the higher standard), appliance and equipment efficiency standards, and weatherization programs to provide minimum energy efficiency standards for low income households.

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### **Action Items Discussion**

The discussion was started by an attendee who commented that educational institutions could be targets for energy efficiency initiatives. They could be opportunities for students to learn about energy efficiency and retrofits. This could also lead to workforce development opportunities and training for working in the sector.

Andrew Pape-Salmon agreed with the speaker, and then asked the attendees if there was interest in creating a roadmap establish policy to reduce energy use in the region.

Rep. George Eskridge affirmed that the road map idea was really good, but asked what the next steps would be to make it happen.

Andrew Pape-Salmon responded that he was seeking support to bring this road map to the executive committee. The rough plan was to form a working group in September, commission a white paper, and give a presentation at next year's PNWER Summit. He then invited attendees to sign up to participate in the working group.

Andrew Pape-Salmon then asked if anyone had any concerns about the plan.

An attendee commented that 10's of thousands of people were employed in energy efficiency in the Northwest. Beyond the energy savings, there are many opportunities for economic development. These opportunities should be emphasised and may help attract interest.