

Anthea Batsakis: When we burn fossil fuel to run a hot bath, how much of the energy created at the power plant actually gets used? Most of us would be surprised to learn that between 85 and 90% of the power released from burning coal goes to waste. It's an incredible waste of resources. But this inefficiency problem has a low profile in Australian energy debates. My name is Anthea Batsakis and you're listening to a podcast from the Australian Academy of Technology and engineering here to discuss energy productivity in Australia is John Judson the chair of the Australian Alliance for energy productivity or A2SE. John, what actually is energy productivity?

Jon Jutsen: Sure. Well, energy productivity is the matter of value we get from using a unit of energy. It's different than energy efficiency cause energy efficiency looks at the energy going into the output that comes from a system. We're looking at the total value that's created from using energy because energy is an enabler in our society and it's used right across the economy. And the real driver is to use the energy more effectively as well as efficiently.

Anthea Batsakis: So what might an energy efficient system look like. Can you give an example, or do you use a future scenario that you could illustrate?

Jon Jutsen: Well, I'll give you a nice story about energy productivity and then I'll give you a little bit of also a differentiator from energy efficiency. So we have been doing a project to measure the temperature and location of food from farm through to shelf or ultimately it could be farm through to the customer because the way energy is used to refrigerate food, the purpose of it is to keep the food in a temperature range that's ideal for that particular product. And if you do that, you get the maximum shelf life and you get the best product quality. And we realized that there was a big opportunity to reduce food waste and improve the output that we get from using refrigeration by being able to accurately measure real time what's happening with products. So whole cultural products and meat, milk and did a project to identify what the biggest opportunities were in this area.

Jon Jutsen: So to cut a long story short, this now looks like it's a opportunity for potentially saving tens of maybe hundreds of millions of dollars in food by using refrigeration, using electricity for refrigeration more effectively, and it's going to be delivered through using Internet of things through real time tracking of product temperature and location. So it wasn't focusing a typical efficiency project might look at how efficient is the refrigeration plan. We're looking at the entire value chain and having looked at how the product is kept cool across that whole value chain and what value it delivers in terms of the value of the product, the food product.

Anthea Batsakis: So from when it's grown to when it's on our plates.

Jon Jutsen: Absolutely.

Anthea Batsakis: It does sound really important. So why don't you think energy productivity has a high profile in energy debates?

Jon Jutsen: The new Minister Angus Taylor is known as the minister for bringing down energy prices, but in fact that's not what consumers or business want. They don't want to juice energy prices. They want to reduce energy costs or energy bills and an energy bill is a price times of usage and the government has not focused at all on reducing usage. And the obvious way that the government could help consumers at the moment to deal with rapidly increasing prices is to help them reduce their use and to help them improve the energy productivity.

Jon Jutsen: It's very baffling to me why that hasn't been a focus of policy because I think it would be highly popular policy. In fact, we've done recent research which will be released in the next few weeks with essential media, which has shown that consumers are very keen to get more information and incentives to help them reduce their energy usage and improve their energy efficiency. But the government in its wisdom has not focused in this area at all. And if you have a look at what they have been focusing on, we've had the Nag, which is now apparently dead, which is primarily a supply focused policy. We've heard about investments in new coal fired power stations in snowy too in a whole raft of potential supply side projects which are going to be high capital cost and high risk, but not doing the simple obvious things which are going to directly help people to reduce their costs.

Anthea Batsakis: To what extent does this lack of productivity in the government effects progress in energy more generally and in Australia as a nation?

Jon Jutsen: It's very good timing because very recently there was a release of energy productivity data and annually they bring out the numbers. And what that showed is that pretty much the last two years we've flat lined. Now the government has a target. The target has been set for the national energy productivity plan to reduce or to improve energy productivity, sorry, but 40% from 2015 levels by 2030 so that target would involve the government having a 2.1% annual increase in energy productivity. And what's happened last year, we had less than 1% energy productivity increase the previous year adjusted down the number to minus 0.1%. So what it's saying is that the government's policy and the national energy productivity plan and the target is not being met. We're veering away from the target because not enough resources or money are going into this program. So the government with COAG has set up a national energy productivity plan and now they're not delivering on it.

Jon Jutsen: The implications of us veering away from the target and not only in terms of people's energy costs because we have very poor energy productivity as a country. If you have a look, we have amongst the lowest energy productivity of developed nations. This is because we've had a history of very low energy prices. And we haven't done what other countries have done to invest in efficiency. So we've got very low energy productivity and now our rate of

improvement is very low, combine that with rapidly increasing energy prices and that's a competitiveness problem for the country. On top of that. Recent reports have shown that we're veering away from also being able to reach out Paris climate targets. So there are only two basic ways that you can meet a climate target and reduce your emissions. That is by reducing the emissions intensity of power generation and usage by using lower emission fuels like renewables.

Jon Jutsen: And the other one is to improve energy productivity, reducing usage by improving energy productivity. Now if the government doesn't want to push on renewables targets and drive that lever forward and they're not interested in energy productivity, I mean we've just got the figures that show that they're not delivering on energy productivity. How exactly are we going to meet the Paris targets? So it's got serious implications and it's really baffling to me why it hasn't been a priority because I would have thought that traditional liberal values would have been on reducing waste and improving productivity. Why this government has chosen not to make it a priority, I don't understand.

Anthea Batsakis: What industries do you think would most benefit from better energy productivity?

Jon Jutsen: Well, it goes right across the economy. Every business needs to improve its energy productivity to become more competitive. If you look at surveys in recent times, they show that it's either the top or the second most important concern for businesses. The fact that their energy costs have gone up so much. So all businesses could improve their energy productivity substantially. And there are huge opportunities now from new technology. And this is something I think particularly interesting for antsy because the digitalization and electrification of industry could substantially improve energy productivity far more than most analysis has shown up to date. So there are a huge technological opportunities right now to improve energy productivity, but it goes right down to harms as well. Poor energy efficiency appliances, poor insulation in homes, poor orientation of homes drives both uncomfortable living conditions as well as high energy bills. And we're after improving energy productivity to give people improved comfort, improved standard of living as well as lower energy bills. And that's the easiest way to address this problem. And it's through improving energy productivity.

Anthea Batsakis: So can you tell me a little bit about what a 2AP is all about and what you're doing with energy productivity? Is there any specific project that is underway?

Jon Jutsen: Yeah, we've got a lot of really interesting projects that have just been released or being released over the next couple of months. So it's again very good timing. We've just finished taking a nice project having a look at how industry 4.0 the digitalization of industry could improve energy productivity in the sector and what we have to look out for if we want to make sure that we get the maximum

benefit from implementing industry for in the manufacturing sector. So that's an interesting one.

Jon Jutsen: One piece of work that a that is related is we're looking at electrification of industry through using electric technologies like high temperature heat pumps for replacing boilers and steam systems in industry. And we've done some feasibility work which proves that this isn't going to be attractive and we've now got an arena application in which we're hoping we'll hear from soon that to run a series of feasibility studies, which hopefully will then lead to pilot projects to demonstrate how we could get rid of steam out of factories and replace it with high efficiency technologies, which are both high energy productivity but also clean out and much more suited to a digitalized industry.

Anthea Batsakis: What industries use the steam technology?

Jon Jutsen: Same as used for process heating, we're particularly looking at for process heating and food manufacturing and other manufacturing industry. It's used in paper, it's used in chemicals. A lot of industries still very heavily based on steam for heating. Believe it or not, like industry 1.0 was the steaming era. So we still have a lot of factories in the steam era that we want to try and drag them into the industry 4.0 2020 era. So that's another project. Another very interesting project that we're doing with the Institute of sustainable futures is the having a look at how we can best meet the needs of a high renewable energy supply using demand side. So what is happening is that increasingly we're getting high penetration of renewable energy on an electricity generation that's more volatile. So the government solution and the traditional energy industry solution is to find investments on the energy supply side to deal with the volatility.

Jon Jutsen: What we've been looking at is how we can work with end users to actually match the changing profile of supply by changing the profile of demand and not treat consumers as fixed low profiles. So we've been working with industry to look at how they can use solar energy that's onsite storage through thermal storage like chilled water, hot water and not just through batteries and load management to provide very flexible load profiles which can vary based on changed price signals from the suppliers. By doing that, we don't have to invest in very expensive supply side options to deal with a renewable future. We can do it by matching it with flexible demand side, so that projects called realm and that project was done with Arena funding and we are now looking to work with government and with the network and retailers to do a large scale pilot to demonstrate how this could be used widely across industry and to have a look at different network pricing options to make it more to give a better price signal for customers to take advantage of that.

Jon Jutsen: So that's the sort of little smattering. The other project that we've continued working on is that cold chain project that I mentioned at the beginning, using the real time monitoring that's turning into a very large pilot at the moment because it's approved to be feasible and that could be a real game changer as

well. So we're doing a lot of interesting stuff and looking forward we're looking to maybe work in the water and wastewater industry to do a value chain analysis for them and have a look at some other sectors as well.

Anthea Batsakis: So really energy productivity is really transforming industry.

Jon Jutsen: Yeah. And that's a very nice way of putting it cause we're really looking for ways to transform the way that energy is used to derive greater value, and less usage. And there are immense opportunities right now because of technological development and also because of the opportunity for matching what's going on, on the supply and demand side. So we're very excited with the opportunity and again baffled by the fact that the government doesn't seem to want to put its effort behind this.

Jon Jutsen: Now I will make it clear. I'm talking largely of the Commonwealth. New South Wales Act and increasingly Victoria particularly are doing a fair bit in the space. So you know it's not that all government at all levels, but there's even room in those jurisdictions and certainly in the other states to do more and that certainly the Commonwealth is not delivering on us National Energy Productivity Plan. We want to see that plan being made much more extensive and being given specific deliverables and timelines for delivery and being forward budgeted because the national plan that was set up does not appear in any forward budgets. So it's basically lip service from the Commonwealth. I mean they are coordinating activities that are largely been diluted by the states but they need to do a lot more.

Anthea Batsakis: What would you like to see them do?

Jon Jutsen: We are actually just developing a son of nip or maybe daughter of nip plan, which is a net 2.0 plan, which we want to give to all of the parties to show in great detail what we'd like done. But we've got a summary of measures that we'd like to take to government in the next few weeks if they'll listen to us, and we are happy to, as I said, we're going to take a net 2.0 plan to all levels of government to try and push forward on that agenda. Because we can see that there's an opportunity to double energy productivity over the next 15 to 20 years. And the government's plan is a target, which is much lower than that, a 40% increase. And as I said, the government's not even meeting that plan, not even close.

Anthea Batsakis: It's clearly such a huge growth area with so much potential.

Jon Jutsen: We have to do it for improving competitiveness of business, for reducing costs for consumers, for meeting our parents targets, which we could do if we really had an aggressive productivity plan. Not that we could meet the targets, but we could increase economic growth and reduce people's bills at the same time.

Anthea Batsakis: So you recently wrote an article for Focus magazine and in it you mentioned that A2AP is teaming up with UTS to form the first institute in Australia on energy productivity and efficiency in business transport and in the home.

Jon Jutsen: Well actually I can give you an update on that.

Anthea Batsakis: Yes.

Jon Jutsen: We are going to be, and I say we meaning UTS and closely aligned with the alliance leading a CRC bid application which will be for next years round and we're certainly looking to business government researchers to join us and end users particularly to join us in this bid for setting up the cooperative research center around energy productivity and that would be addressing many of the innovations that I've been talking about and would allow us to do things at a scale which would be necessary to meet our needs of doubling energy productivity.

Anthea Batsakis: Well, I mean it sounds very multidisciplinary.

Jon Jutsen: It's multidisciplinary and it requires a focused set of resources to go into the area. Unlike what's happened up to date. I mean, we really would like to see an independent energy productivity authority set up to deliver aggressive target with deliverables, and a five year rolling forward budget. And then we could get serious about improving performance in theory.

Anthea Batsakis: Thank you so much.