Inquiry into energy services industry

Melbourne — 14 November 2005

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Witness
Mr B. Williams, Environmental Urban Designer, VicUrban.
The CHAIR — Thank you very much for your attendance today. We have Barton Williams who is an urban designer for VicUrban. All evidence taken by the committee is taken under the provisions of the Parliamentary Committees Act and is protected from judicial review. However, if you make comments outside the precincts of the hearing they are not protected by parliamentary privilege. All evidence is being recorded today by Hansard and you will receive a proof version of the transcript within the next month. We have kept you waiting, which I do apologise for, but we would like to still finish at 4.30 if we can possibly can because we still have a meeting after that. If you want to commence your presentation, we will then have time for questions.

Mr Williams — Thank you for that. I am not sure how far I should go so maybe you could just stop me at any point and we can start going into the question stage. I was not really sure how far to go down the line of giving you context so if it is things you already know, please hint and I will keep going.

I want to talk about VicUrban and its delivery model and the energy issues and initiatives in Aurora, one of the projects we are particularly involved in which is really trying to emphasise a lot of the sustainability and energy initiatives and which are particular to this energy inquiry. I will also then talk about the terms of reference and address them. Who is VicUrban? It operates under a sustainability act of 2003. It is there to promote the best practice of urban community design and development having regard to transport services and innovations in sustainable development. VicUrban is really the private arm of government and is enacted to demonstrate and lead the private sector in how we can actually achieve sustainable developments within commercial reality. It essentially arose from the merger in 2003 of the Urban and Regional Land Corporation — some of you may be familiar with that — and the Docklands Authority. It is about two years old now. It is principally financed through Treasury.

VicUrban operates by and defines sustainability by five core objectives. It is based on community wellbeing, environment, commercial success, housing affordability and urban design excellence. It recognises that sustainability is holistic; it is not just one of these measures — it is all of them together. We try to measure our projects based on these five core objectives in realising our developments. We work across the state and also within metropolitan Melbourne itself. We work proactively in partnership with other government bodies and the private sector through regulatory intervention, public education, engagement in improved housing design and, crucially, capital investment in sustainable infrastructure up front at the master planning stage.

Aurora is an example of VicUrban’s delivery model in terms of achieving sustainable development. It is principally our flagship sustainable development so it is one where we are trying a whole range of sustainability initiatives to really see if we can make them commercially proven. It is 620 hectares in size; it is an integrated house and land development with about 8500 homes, hopefully with a population of around 25 000 people in 10 to 15 years. It is a very large project. It is situated approximately 20 kilometres from the CBD adjacent to the Craigieburn bypass and is right on the edge of the Melbourne 2030 growth corridor. It has links to nearby hospitals and commercial centres. Its real vision was to create an exempla of sustainable mixed-use housing development with particular regard to water and energy conservation. The yellow marks education facilities — there are five schools proposed, two town centres and about 28 per cent of the development will be attributed to public open space. A significant area has been set aside for recreation, conservation and public space use.

This is what I call a sustainability tree demonstrating a whole range of sustainability initiatives at Aurora. In energy terms a key driver of the project was that per capita Victoria is one of the highest greenhouse producers in the world. We need to reduce our reliance on coal-fired electricity generation and focus on natural gas and renewable energy electricity generation. You can see there are about six different initiatives we are introducing to address the energy issue that we recognise is a global and state issue. To reduce greenhouse emissions it is really about reducing transport energy use, operating energy use, peak summer demand and embodied energy construction and materials. I want to quickly go through these one by one. This is a table that demonstrates the make-up of transport energy use, operating energy use, peak summer demand and embodied energy construction and materials. I want to quickly go through these one by one. This is a table that demonstrates the make-up of transport energy use, operating energy use, peak summer demand and embodied energy construction and materials. There is a real opportunity for good subdivision design to reduce vehicle use. It also implies the link to transport use is linked to the types of residential design. Traditionally we would have been developing what you can see on the left side — conventional subdivision design. It is very car dependent, with poor walkability and lots of cul de sacs. I am sure you have lived in lots of estates where there are lots of cul de sacs. There is low density, around 10 buildings per hectare.

There is single use, no real mixed use at all, and a lack of onsite amenities — shops, schools and so forth. Then you have ResCode, which is clause 56, which is an improvement on that. Now we are talking about the inclusion of more amenities — shops, schools, employment — that is what it is asking for. Also, more medium density —

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rather than 10 dwellings per hectare now to about 15. Aurora is essentially trying to work on the traditional
eighbourhood development design model which is really about 25 dwellings per hectare. Aurora is probably
achieving around 17 dwellings per hectare, so we have not quite reached the 25 figure yet. It is an aim for us and
we are working towards that. But the Traditional Neighbourhood Design is certainly the model we have been
incorporating to design Aurora.

It is interesting that based on work conducted by Energy Victoria and TTM consultants it appears that the
ecological footprint can be reduced from 3.2 tonnes for a conventional dwelling to about 1.5 tonnes of CO$_2$ for a
traditional neighbourhood design, which is essentially Aurora. They are also saying you can probably get a 50 per
cent reduction in vehicle kilometres travelled by going to these sorts of developments. This is what we are hoping
to achieve. Again, the jury is out on whether we can achieve it. This is very new and Professor Peter Newman has
done a lot of work of this area which you would be aware of and Aurora is really an attempt to try and realise that,
but as Peter Newman sort of indicates it is really reliant on very good urban design, a commitment from
government and obviously very strong link to transport.

When we talk about operating in terms of giving you some context it is projected that by 2010 residential operating
energy use will increase to 128 megatons of CO$_2$ which is well above the Kyoto target, which is essentially about
90 megatons of CO$_2$. So in more detail the major influences of CO$_2$ emissions for the building community relate to
building envelope efficiency, building size, appliance efficiency, fuel source — which is really about trying to
move away from electricity generation and through coal-fired turbines to more gas and renewables. You can see
that from the builder influenced CO$_2$ budget diagram there is a real opportunity to try and manage our heating and
cooling needs and our hot water need. Is this material that you have already been through? Is it all fairly familiar?

Historically this has been largely due to poor subdivision design and individual home designs. You can see when
you get down to the residential or the home level that a lot of housing in Victoria is significantly or quite largely
energy intensive. They are very poorly designed so that they need a lot of heating and cooling particularly in
summer which Ric raised with the peak summer demand. We have traditionally used quite inefficient appliances in
heating and cooling our homes, in our laundry with washing machines and so forth. Also, there has been a lack of
renewable energy use so there are some real opportunities they are to diminish operating energy.

In terms of peak energy demand which is one of the big drivers during summer you can see from this diagram or
table, on the left which is the old suburbs it shows that the red is your summer peak demand for airconditioning. In
old suburbs it was about 345 per cent over and above the operating energy right across the year. It has been
interesting that as we have developed new suburbs we have actually become even more energy intensive. As you
can see there we are about 550 per cent over the base of operating energy use. So there is a huge challenge there to
reduce energy, particularly during peak energy demand when our homes perform so poorly that we all put our
airconditioners on. This is the result. Interestingly enough EnergyAustralia which is an energy retailer states that
the rise in peak power usage presents huge economic challenges for its company and others. They give as an
example that 10 per cent of their network assets valued at $1 billion are used for only 1 per cent of the time. So it is
an interesting statistic basically saying that we could make some huge energy savings both at the infrastructure and
home level if we managed our peak load demand in our homes.

The peak energy demand is really caused at a subdivision level by access to cooling summer winds and a lot design
without a real regard to solar orientation. The Aurora project we are doing with VicUrban is trying to address that.
Also, at the individual home level it is really about poor passive design, excessive unprotected glazing — in other
words, lack of summer shading in particular and poor ventilation. There is this perceived market need to have
reverse cycle airconditioning; you have all probably seen the proverbial box outside the building which often
comes on after the home has been built because the consumers realise the home is not as comfortable as they
thought it would be. So how do we actually achieve this? To reduce our greenhouse objectives is really to reduce
car-based vehicle movements, dwelling operating energy, summer peak demand and embodied energy
construction. That really relates to six-star energy efficient housing which I will quickly describe.

Six-star energy-efficient housing is really using the FirstRate modelling tool. I do not know if you are familiar with
the Victorian government’s software modelling tool. Rather than its being a five-star home we are actually making
sure that all our homes at Aurora, 8500 homes, will be six-star so they will be much higher energy efficient homes.
That will that hopefully mean that we will have reduced peak demand requirements in our homes as well.
How are we doing that? We are doing it by optimising solar access distances between buildings. We are making sure that we are achieving the best building type for the orientation at which it sits. We are also ensuring that the subdivision design guidelines are very much aligned to achieving six-star energy efficient housing, and our building partners are very much conforming to those requirements. Currently we have about 10 building partners in developing the Aurora project. As I said, the six-star building envelope is a software tool which is used to model and ensure that our builders exactly achieve six-star performance. We are also making sure that our heating and cooling systems are 4 to 5 stars because, as I said, many houses have traditionally been using quite inefficient appliances. One of the ways to address that is to ensure that when consumers purchase their homes the builders install four to five-star heating and cooling systems into those homes.

One of the important things we have initiated is to ask the residents to sign up to community power, and I think some of you may be familiar with green power. So community power is an amalgamation of a number of councils who have got together to set up a consortium which allows them to negotiate with an energy retailer to purchase a renewable energy tariff at a very competitive rate. We have adopted that as a very convenient mechanism, in which we sign that up on behalf of the residents, but they still have the choice of going to another energy provider if they wish to.

This table is about embodied energy, and the yellow line indicates high operating energy using homes. You can see that as homes become more energy efficient the purple line, which is the embodied energy line, becomes far more significant. What is interesting is that as we go to more five or six-star housing it becomes more apparent that we now need to consider the use of materials in housing construction.

How has VicUrban, or Aurora, tried to address that? This slide shows the VicUrban or Aurora eco-materials selector, which has been specially designed for this project. We hope it will become a tool for use by others in the industry. We have asked the builders to specify their building materials based on a minimum value of environmental points. So they have to achieve 80 points. They can achieve them by choosing materials that are from any one of these construction systems. Those materials are then linked to a supplier database and in that way the builders are able to negotiate with those suppliers to ascertain whether they can build their homes to an environmental standard. We have set it at 80 points, but essentially you can set it at any level. This has been designed to enable the building industry to move forward. We have recognised that it is fine to set these energy targets, or to ask the community to move down an energy efficient line, but unless you provide them with tools to do it they are not going to get there. So this is a way of recognising that and encouraging the building community to try and start purchasing their building materials from what we would deem as an environmentally friendly supplier base.

Mr DRUM — And what you have there is an example of the floor structure?

Mr WILLIAMS — That is right, it is an example. I can get you a copy if you would like the whole document — —

Mr DRUM — But there is the potential there to rack up nearly 70 or 80 points.

Mr WILLIAMS — Yes.

Mr DRUM — But you are only asking for 20 points.

Mr WILLIAMS — You need to achieve a minimum of 20 points in that area; that is right. But one of the easiest gains is in the floor structure and that is generally through concrete. So if they specify recycled concrete with fly ash and slag and recycled steel, then they will get a very good score, and there are now a number of suppliers out there who can provide that. The great thing about this is that it is a performance-based tool, so builders can pick and choose from a whole range of these things. It has been well received, and we are getting a lot of recognition externally. Other local governments have started to use this. I think you may have heard of the STEPS program and this tool is starting to be used as a part of that scheme.

What is also really critical is the verification program. It is fine to set up these regulations, policies or strategies, but at the end of the day it is like the 5 stars, you need to be able to verify that you can build and that the homes are built as you have specified. So we have set up a verification system to ensure that when builders specify these materials, invoices are provided to us to verify they have built the building based on the requirements or the eco-selector they filled out.
The response to the Eco-Selector is that the point scorer is a very good beginning point. What is fantastic is that it is already starting to apply pressure on manufacturers to change. We are already being lobbied by various manufacturers to get onto the database, which is a fantastic thing. Some of them have changed and engaged in the process, and that has meant that the builders can now buy from them and that has been a good thing. What is also fantastic is that other councils are starting to look at this as a tool to use. What is interesting is that this is a beginning point. It is not a definitive document; it is a draft document that needs to be worked on much more. But it sends a powerful signal that here is a tool that can be used and developed.

This slide shows the terms of reference that you asked me to talk to. I can finish there and you can ask me questions, or I can start to talk about them. It is your choice.

The CHAIR — We have not got very long at all. We might ask some questions. We will have access to all of this?

Mr WILLIAMS — You will have the PowerPoint presentation.

Ms DUNCAN — Is it the case that if I buy a house at Aurora, I have to have it built by one of those builders?

Mr WILLIAMS — Yes. It is an integrated house and land development.

Ms DUNCAN — Okay.

Mr WILLIAMS — There may be some lots, but very few will be sold to the market. But they will be sold with very stringent controls, so it is the same that the builders have had to apply. In some ways consumers who go down that line will find it a very difficult one.

Mrs COOTE — Is it far more expensive overall?

Mr WILLIAMS — It depends on how you measure it. It is interesting. If you do an integrated house and land development, the costs come down considerably. If you design the subdivision to ensure it achieves those performance or energy targets, which is what we have done, then the costs go down. As an example we have found with terrace housing that the cost is almost neutral; there is no real additional cost. If you go to semi-detached housing it is roughly about $1000 more — that is a five-star house. If you go to a detached home then it is probably about $2000 more. So then it comes down to how you articulate the benefits. In many ways they are attributed to the consumer; the consumer gets a lot of the benefits that we initiate.

Mrs COOTE — Is there careful monitoring of that so that eventually you can use those cost savings as a marketing tool longer term?

Mr WILLIAMS — We have. One of the interesting things is that the building community actually sells these homes. VicUrban sells the development and the precinct, but the builders also have to sell the homes themselves. So they have to design and build these homes so that they meet the market requirement. For us it will be interesting to see how well the market responds to these products. We have had an off-the-plan sales event quite recently and the response has been fantastic.

Mr DRUM — The figures you had in relation to a standard residential development versus Aurora?

Mr WILLIAMS — Yes. Which table was that from?

Mr DRUM — You had some statistics which compared the driving figures for a normal residential development versus Aurora. Something like 3.2 hours down to — the first dot point on the slide in tonnes per dwelling per year. Would that be because of the type of people you have in the dwellings? Is there a certain type of person who is prepared to live where you might have 20 dwellings per hectare versus another type of area? What would you put that down to?

Mr WILLIAMS — It is a good question, and I do not necessarily have a clear answer to that.

Mr DRUM — It would not just be because of the walkability of the area or because there is a nearby shop that you can walk to.
Mr WILLIAMS — You are talking about whether a more affluent person would live here as opposed to a less affluent person?

Mr DRUM — Yes.

Mr WILLIAMS — I do not think that is really the reason. The reason is more that you ensure the quality of your urban design in terms of your amenities to these areas, the links to public transport and links to schools and commercial centres. It is really about trying to ensure that not only do you have a very good urban design outcome but your density level and your urban intensity are also very much there. It is not just one aspect or issue. It is a very complicated answer. You are asking a complicated question, and it is not an easy one to answer.

Mr DRUM — I know, but whatever indicator you have there, it is half, which is significant.

Mr WILLIAMS — It is quite significant, but I would put a caveat on that, because that was based on work done in 1993 by some consultants we had. To be honest with you, I think the jury is still out on this. This is really to say, ‘This is what we are trying to achieve and this is the data that we have that gives us the confidence to say we should go down this path’. I suppose Professor Newman is probably one of the leading authorities in this area. He has probably done the greatest amount of work in terms of establishing the vehicle reduction levels that can be achieved through good urban design.

Mr BENJAMIN — With a house having a 30 or 40-year lifespan, why are we only promoting a 5 or 6-star house. That is a minimum standard. Why are we not going for a 7 or 8-star house. Is the technology not there, or will the market just not buy a house at that rating?

Mr WILLIAMS — It is both. Firstly you have to try to take the industry to a certain point. Taking the industry to 6 stars is a huge, huge endeavour. I think we are nearly there. You have recognised how difficult it was to get the industry to go to 5 stars. Going beyond 6 stars in energy benefits in terms of the building envelope benefits, I am not sure you are going to get the gains your looking for. You should really be targeting your energy gains through appliances and your heating and cooling systems, so it is starting to address other issues apart from just the building envelope. I think 6 stars is pretty much the limit. I do not think you really need to go much further than that, but now start really addressing the other areas that demand energy.

The CHAIR — Does VicUrban measure the performance of other housing developments?

Mr WILLIAMS — We have set up a new charter called the VicUrban sustainability charter. As you will recall, I set up the five core objectives. In that charter we have articulated some very detailed performance measures that are also aligned to a score system. That charter — unfortunately I cannot show it to you here today, but it will probably be released very soon — is used by us to measure our developments. It helps us to design our developments, and if we can achieve the minimum base points that we deem are a minimum standard for VicUrban, then that development is a go. Then we monitor that and report on it over the life of the project. So we always try to ensure that it is achieving the targets that we set. But we do not measure other developments outside VicUrban’s portfolio.

The CHAIR — Thank you very much.

Committee adjourned.