

ECO-ACUPUNCTURE: DESIGNING FUTURE TRANSITIONS FOR URBAN COMMUNITIES FOR A RESILIENT LOW-CARBON FUTURE.

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INTRODUCTION

Over the coming decades, as we navigate the end of the fossil fuel era, probably soon to be known as the *carbonaceous period* in human development (or more evocatively, after Yusoff [2010], the period of *the economy of dead animality*), we can predict with some certainty that cities will be *the* locus for action for whatever emerges to replace it. This is not just a recognition that more than half the world's population now resides in cities and therefore that all actions in response to the threatening global conditions will reflect the interests of city-based citizens; it is much more. The very *nature* and *form* of cities - their *physical* and *cultural* dimensions - will amplify their place in the coming 'post-carbon' revolution - a revolution to transform the energy basis of the economy and to deliver resilience in the face of changed global conditions. This revolution will be as significant as any in human history and it will be first and foremost an *urban* revolution (even if it does also have the dimensions of an industrial, economic, 'metabolic', social and even ethical revolution).

This paper reviews a program of engagement with urban communities in the city of Melbourne, known as Eco-Acupuncture (EcoA), that has been developed over the last three years to respond to the challenges of that impending revolution. The critical question addressed by that program and considered in this paper is: *How can we effectively initiate and support rapid structural and cultural change within existing urban environments and communities, to reconfigure urban form and life in anticipation of the projected impacts of climate change and peak oil?* This is not a theoretical question; the policy challenges for governments in dealing with the rapid transition from a carbon based economy are significant. For local and city governments, where the connection with the concerns and fears of urban citizens can be most direct, where land-use planning decisions often intersect with projected climatic changes, and where vulnerability to energy pricing is already part of some community strategies, developing a coherent set of policies and programs for this transition has become a new priority. However, negotiating a process of transition in a democratic society quickly confronts what Beck [2010] identifies as the "urgent and somehow tabooed question" in the huge project of the "greening of society": how to develop support from below, the "backing of everyday people of different classes, different nations, different political ideologies...support which in many cases would undermine...[current] lifestyles...consumption habits... social status and life conditions" [255].

EcoA recognises that a transition out of the carbonaceous era will require the reconfiguration of existing systems of provision¹ that are both physically and culturally embedded in the structure of urban life, making 'support from below' more difficult to secure. The program proposes a way forward through the agency of design and engaged future visioning and, as the name implies, the translation of those visions into sets of targeted 'niche' interventions in the urban fabric to release energy for change.

CITIES AND URBAN LIFE AS A CRUCIBLE FOR CHANGE.

Cities currently account for around 75% of global energy demand and 75% of greenhouse gas production [Satterthwaite and Dodman 2010; UNEP 2011]; they are now the structural engines of the growth characteristics of the economy that threaten to deplete our 'natural capital' [Hawkin, Lovins et al 1999] and therefore our future survival. With a rapid rise in the price of fossil fuels, particularly oil²,[□] with a shift to a renewable, low-consumption energy system, with new climate conditions and extreme weather events beyond the historical range of variability, there is an evident danger that the existing fabric of a city could become inhospitable, maladapted for the bio-physical needs of its inhabitants. As Newman [2010: 134] puts it, "the design of [a] city is totally enmeshed in its infrastructure priorities". New energy and climate conditions may see the inhabitants of a city enmeshed in a designed urban infrastructure that cannot easily accommodate new, radically different,

priorities. This is *the urban as a (bio)physical crucible* - a constructed physical ecosystem that could be stretched beyond its range of equilibrium conditions.

But there is a critical and complementary attribute of cities: The *urban as a creative-cultural crucible*. Here, dwelling in that very human dimension of urban life, there are divergent and conflicting forces that will be every bit as critical in shaping the response to future challenges. The physical form of cities is not merely constructed, it is more meaningfully 'designed'; it results from purposeful human agency, so much that is 'cultural' is embedded in 'the material'. The designed urban environment is rich with semiotic content, signifying and reproducing ideas of survival and progress, of social order, of the power of capital and of our relationship as a technological species to those 'ecosystem services' that we have (apparently) been able to 'mould to *our ends*'. To put it simply, urban life mediates our understanding of nature and our place in it. Yes, this includes a disconnection from the experience of natural systems - of 'raw nature' - a facet of life that Hamilton [2010], along with others (e.g. Hume 2009), see as one of the reasons that it is so difficult to develop community understanding of climate change. It is more than this; in the city, 'nature' is not just 'hidden' from view, it is refracted and re-formed, projected as a conquered territory serving our economic, social and political ends. We read, from everyday life in the physical fabric of our advanced, air-conditioned city, a "triumphant record of the success of our technological project of the mastery of nature, confirming what is it to be human" [Ryan 1986: 247]. Our deeply embedded dependence on a fossil fuel existence is cultural as well as physical.

However, paradoxically, when it comes to social and technological innovation and to revolutionary ideas and movements, the urban crucible is what Glaeser [2011] has coined "our species greatest invention" because it amplifies the vital, dynamic and creative potential of human interaction and 'collaborative brilliance' - for art, for knowledge, for prosperity, both material and social. It is this 'nourishing and flourishing' nature of urbanity to which one can attribute its continuing global success. Cities and urban life have the ability to nourish the very social characteristics that will help its citizen-species to evolve, to adapt, to innovate, to transform the conditions for life and well-being. The capacity of humans to anticipate change, to envisage alternative conditions, to act to structure a different future in the expectation of better outcomes, is evident throughout history. At a time when the global community and international institutions (and many national governments) seem unable to act for the common good in relation to climate change, cities and urban communities seem to offer hope that they are - and will continue to be - *the cohesive and creative social entities that do take up the challenge*³.□

If there is hope for humanity as we respond to the revolutionary challenges of the first half of this century then it will depend on processes - policies and programs and creative movements - that can negotiate these conflicting facets of urban and city life. This is the rationale for the EcoA program.

THE VICTORIAN ECO-INNOVATION LAB - SUSTAINABLE TRAJECTORIES FOR URBAN LIFE.

EcoA has evolved from the work of the Victorian Eco-Innovation Lab (VEIL) a design-research laboratory established to change expectations of the future in response to environmental challenges and to identify innovative pathways that could realise those changed expectations⁴. VEIL operates on a model similar to an innovation and research-led company, but in the public arena, supported by a range of research, university and philanthropic grants, with more of a focus on public good than commercial outcomes⁵. VEIL has built an 'open innovation' structure, creating since its launch in 2007 a substantial, fluid, network of researchers, academic and professional designers, government officers, members of community organisations and post-graduate and final-year design students from multiple universities. Its body of work includes future concepts and prototypes for sustainable goods and services, built infrastructures, new systems of provision of energy, water, food and transport, and for new patterns of low carbon, low consumption, living.

At the core of VEIL is an evolving 'think-tank' of academics and professionals who: review existing research; critically evaluate scenarios for the future; explore new design directions and possibilities for environments, systems, products and services; initiate new research projects to test concepts and scenarios and, most fundamentally, actively communicate all that work as it progresses. Open communication stimulates feedback, encouraging contributions to the field of ideas, and widening the network of engagement.

On an approximately six-monthly cycle, the current state of think-tank investigations of sustainable futures is distilled as a set of 'briefs' for studio-projects in the design education program in partner universities; these are developed to explore the most promising (usually the most 'radical' or 'blue-sky') of the ideas developed in the think-tank. Students spend around one hundred days each in research and design-concept development, taking

the brief as a starting point. The studios *amplify* and *conceptualise* the think-tank investigations. At the completion of each educational term the total corpus of the studio work - usually many hundreds of reports and visually developed design propositions - is widely exhibited and catalogued on the web and presented at conferences, meetings and seminars. Critical reflections on the student works are produced by the think-tank, expanding the knowledge base for its further work.

SETTING VEIL AND ECO-A IN CONTEXT

Sustainable development meets climate change.

The VEIL program has been influenced by the emerging realisation that Climate Change (CC), unlike any other environmental issue, presents democratic institutions with 'diabological' policy challenges (to use the terminology of Garnaut 2008). Asking institutions and citizens to respond to climate change is asking for action *now*, to deal with an issue that *cannot be observed* directly, in order to avoid *future* events which cannot be forecast with *certainty*, either in their scale of impact, or in terms of when and where they will occur. By the time CC 'reality' is sufficiently clear for a sufficient majority of observers to support action it may well be too late to avoid its more catastrophic effects. Sterne [2007], Garnaut [2008] and others have argued that the longer we wait to take action the more costly it will be. Whatever the pace of action, significant programs of adaptation to a changed climate will be required. It becomes essential that approaches to mitigation do not make adaptation more difficult (and vice versa).

It is now clear that the increasing certainty of the evidence for the human forcing of the climate – improvements in impact modelling and mounting empirical evidence showing observed warming effects running significantly ahead of IPCC⁶ predictions [Garnaut 2011] – has not translated into building public support for action. As Hume [2011] expresses it in an editorial in Nature Climate Change: "Crafting increasingly consensual reports of scientific knowledge, or leveraging more engineering and technology, will alone never open up pathways... to the public imagination or the execution of policy"[178]. Recent literature analysing this situation [see for example, Giddens 2009; Hume 2009; Hamilton 2010, Szerszynski, and Urry 2010; Bhaskar et al 2010] has started to address the multiplicity of factors that affect peoples response to the scientific data. As Wynne [2010] says: "It becomes important to ask what kind of knowledge we understand ourselves to have, about our climate and [the] human activities and relations which may affect it" [291]. The search for answers to such a question has quickly moved beyond the investigation of the public understanding of science. The 'kind of knowledge' that grounds the public response to CC requires consideration of (for example): our deep, historically constituted, cultural and social relationships to the weather [Szerszynski 2010]; conflicts between lived, local, 'realities' and global 'abstractions' [Jasanoff 2010; Swyngedouw 2010]; conflicting understandings of the nature and credibility of science [Hume, M. 2009; Wynne 2010; Rommetveit et al 2010]; the social constitution of conceptions of present and future risk [Hume 2009]; an ignorance of the science of natural systems, evolution and symbiosis [Hamilton 2010; McCright and Dunlap 2010]; the constitution of the climate problem as narrowly scientific and technological [Szerszynski and Urry 2010]; an addiction to material values and consumption and the fetishisation of growth [Romm 2002, Hamilton 2010; Hume 2010]; the oil-based structures of economic and political power and control of the media [Hamilton 2010; Yusoff 2010]. Recent literature [Nordhaus and Shellenberger 2007; Compton and Kasser 2009; APA 2010] has also questioned the language used to articulate the threat of CC in campaigns for action, with real concerns about psychological disempowerment and reactive passivity when CC is projected as a looming crisis of immense proportions [Beck 2010; Frank 2010].

Given that the political response to climate change in Australia (as in many countries) depends on gaining support from urban citizens, it is strange that largely absent from the literature on the diabological nature of CC is consideration of the complex influence of cities and the designed environment introduced at the beginning of this paper. Shove [2010] raises it as a 'question not being addressed' within social science research on the meaning and response to CC; otherwise, generally, the built environment is treated as a mere 'inert' backdrop against which the real play of social and cultural institutions that "shape people's sense of what is *permissible, desirable and possible*" takes place [Szerszynski and Urry 2010:3 italics added]. Yet, when it comes to actively addressing issues of CC (mitigation and adaptation) in planning and design within existing conurbations and gaining 'support from below', it is exactly the perceptions of communities about what is *permissible, desirable and possible* that become a critical determinant of options for action and those perceptions are substantively affected by the urban experience. This, as we will see, is what EcoA attempts to address.

Eco-designing sustainable futures: from greening of elements to radical systems change.

VEIL sits within this complex and contested terrain of 'the response to CC' (even if its remit is wider in environmental terms) and its praxis has evolved over time as community attitudes and conflicting views have become more apparent. From its outset the program proposed an approach that could be labelled as 'designing transitions' [Ryan 2008a], sitting within a small but growing field of design as a 'mechanism for social and technical transformation' [Walker 2011] and 'social innovation' [Manzini 2010]. The *design* focus derived, more or less directly, from the field of 'eco-design' (or design for sustainability) that has developed globally over the last two to three decades, initially focused on re-designing consumer *products* to reduce their life-cycle⁷ environmental impacts (inputs and outputs) [Gertsakis, Lewis and Ryan 1996; Brezet and van Hemel 1997; Tischner et al 2000; Ryan, C 2003; 2004; Crul, Diehl and Ryan 2009]. Product eco-design quickly developed from a simple focus on technological and material improvements to manufactured products (and later, buildings), to sophisticated methodologies⁸ to reconfigure and reshape existing products (or develop new ones). These methodologies aimed to lower environmental impact of products through holistic attention to their *function* and their *form*, addressing a set of characteristics that included their (life-cycle) resource inputs and outputs, their use-value, interaction with user behaviour, end-of-life value (and so on) and, most importantly, their ability to out-compete more environmentally deleterious products in the market. Their market successes depended on a coherent resolution of both functionality and aesthetics, technology and semiotics, so they generated a consumer desire for their new technical capacities, making 'eco-performance' a fun, sexy, 'must-have' feature.

The inexorable logic of the 'life-cycle' focus of eco-design quickly saw a widening of the design boundary beyond the 'product-as-object' to encompass other aspects of the systems of production, distribution and consumption that defined its market. For example: changes to the resource/material inputs for a product are limited by the wider materials/resource/energy streams available; the success of design for recyclability or re-use depends on the existence of recycling/reuse systems within the market and also, critically, on consumer willingness to engage with the process of end-of-life recycling. There are also significant questions about the potential contribution of eco-design to overall reductions of environmental impacts at a societal level. Is it possible to grow an environmentally benign economy through the greening of products? The *win-win*⁸ proposition that the economy can continue to grow provided there is significant and on-going reductions in the impacts of all goods and services, rests on assumptions about the relative rate of growth of the economy (overall consumption) compared to the rate of reduction of the impact of the 'units' (goods and services) consumed. Figures of 60-80% reductions in product (life-cycle) impact achieved across a large range of eco-designed products seemed at first to be a positive affirmation of the *win-win* scenario.. However, extrapolating those individual product gains to the economy as a whole is problematic on three counts: large product impact reductions are often 'one-off', as past inefficiencies in design are corrected, with further iterations of eco-design showing increasingly marginal improvement; growth in consumption of many products in many markets (think cars) is easily outpacing unit efficiency improvements so that the net result is an overall deterioration in conditions [Ryan 2002; 2003]; finally, there are 'rebound' effects in which improvements in the efficiency of products become a stimulus for increased consumption in another area (an example of the Jevons paradox, Jevons 1866) [Greening and Difiglio 2000].⁹ Reflecting on early trends in these issues, Brezet and van Helmel predicted in 1997 that overall environmental improvement (from a societal perspective) would require a transition from *product-focused* design and innovation program to *system-focused* one (a process expected to take many decades).

We can now say that eco-design research and practice demonstrates a need for radical change to *systems* of production and consumption [Ryan 2008; Tukker and Tischner 2006; Tischner and Verkuijl 2008; Crul, Diehl and Ryan 2009]. This conclusion seems broadly consistent with developments in the field of innovations research [e.g. Varian 2000; Weaver, Jansen et al 1999, Freeman and Perez 1988] and in the broader field of sustainable business strategies [e.g. Hawkin et al 1999; McDonough and Braungart 2001; WBCSD 2002; Svendsen and Laberge 2006; van Bakel et al 2007].

It is also clear that the '*systems*' that need to change are fundamentally *socio-technical* in nature; environmental problems cannot be tackled through innovation in technology without associated changes in systems of provision, in user behaviour, in lifestyle and culture (social innovation). The World Business Council for Sustainable Development put that point very succinctly in 2001 when it concluded, from many case studies, that innovation for a sustainable future requires "*finding new ways to do old things as well as new ways to do new things*" [WBCSD 2001:7].

An innovative approach to designing socio-technical transitions

VEIL can be considered a program to 'find new ways of doing' - ways of transforming human practices - for a sustainable future. The program itself is an innovative 'new way of doing' in the field of action for sustainable development; it was never intended as merely an idea generator, but as action-research and action-engagement, working via the agency of design, scenarios and visions, to *bring about change*. Visually communicated ideas are its tools to catalyse social action; the communication of representations of potential new 'ways of doing' is intended as a disruptive intervention in the '*conceptual marketplace*'.

Preliminary research for VEIL [Ryan 2005] had identified a shift in the market place towards the projection of future *concepts* for *potential* products services and built environments 'designed' for possible release to the market in the future (typically within a decade). This *conceptual marketplace* - "exhibiting the future in the present" [Ryan 2002b:7] - has become a critical arena for business, where consumer responses can be evaluated and product trajectories refined before the high capital investment in 'bringing-to-the-market' is required. The preliminary research suggested that the future-concept market is pervasive, stimulating consumer expectations and desires by enveloping them in a '*conceptual landscape of future consumption possibilities*'.

Active investment in the conceptual market forms a (relatively) new mechanism by which existing socio-technical regimes [□][see for example Geels and Schot 2007] maintain stable trajectories of innovation and development, inhibiting new pathways of (systemic) innovation. Of course, as history demonstrates, socio-technical regimes are not stable; disruptive transitions from one stable regime to another do (regularly) take place [Geels 2002]. In the normal dynamic of development and innovation, new novel practices or technologies (ways of doing) emerge from organisational niches within society - from entrepreneurial corporations, small businesses or cooperatives and even from grassroots activist communities, cultural groups, towns and neighbourhoods [Seyfang and Smith 2007]. These novelty incubation spaces will often start with relatively "unstable socio-technical configurations with low performance" that are "carried and developed by small networks of dedicated actors, often outsiders or fringe actors" [Geels and Schot 2007:400].

VEIL began as an experiment [□] to test the value of competing as a disruptive force in the conceptual landscape, to effect a realignment of current relationships between consumers, business, professions, policy and innovation processes, to tip the balance towards more radical (and more rapid) socio-technical regime change. This includes a process for 'revealing' current niche developments that 'prefigure' future visions¹⁰, that has drawn many 'outsiders and fringe actors' into its program to project scenarios for their future.

A design-research and design-action framework

The need for radical systems change, the diabolical challenges of CC, the embedded cultural and physical dependencies of a carbonaceous urban environment, the structuring of expectations from a pervasive conceptual market as well as the potential for flourishing 'urban' movements of innovation, has defined the VEIL approach to design research and design action, particularly for EcoA. An early eight-point design framework developed for the program (see: Fig 1) reflects the initial resolution of the challenges and opportunities. Two aspects of that framework (resilience and distributed systems) have grown in importance since the program commenced. There are dimensions of transformation that will derive from shifts in climate - and climate variability - because they conflict with the infrastructure of urban existence (designed around historical climate patterns with the expectation that those patterns will hold into the future). When the past 'envelope' of variability is exceeded, critical aspects of life (housing, water, food, transport, health) can suddenly prove to be brittle, putting living conditions at risk. So the transition from our carbonaceous existence will require the development of *resilience* - most simply, the ability to cope with climatic shifts and extremes - at the same time as transforming our energy systems. Systems change has to support the introduction of a zero-carbon energy system *and* a resilient community with great adaptive capacity. As the framework in Fig 1 shows, the re-conceptualisation of future resilient systems of provision - the core 'what-if' of the VEIL design visioning - is posited as a paradigm shift in infrastructure models, from 'centralised', long, linear delivery systems with increasing uniformity in supply and distribution technologies, to 'distributed' - more localised - systems with increasing diversity of supply and patterns of consumption [Biggs et al 2010].

Fig 1: The VEIL Design Framework

Transformation of socio-technical systems:

the reconfiguration of the socio-physical-technical systems that supply the necessities of living - products, resources (energy, water, food); transport; information; built infrastructure; and so on. These systems are complex and adaptive.

A focus on 'the urban' as a site for transformation:

Explorations of transformation cannot deal with fragments of the economy or living conditions in isolation; innovation in systems has to include the interaction between social and cultural life and physical and technical systems.

Resilience - mitigation and adaptation in conditions of increasing uncertainty:

The future will be shaped by the processes of reduction in the 'carbon intensity' of the economy, but 'adaptation' to changing climate conditions and severe weather events may yet prove to be a stronger force for change. Existing urban infrastructure and systems of provision can be very vulnerable to these new conditions. We need to design 'with uncertainty' and 'for resilience'.

Distributed systems of provision:

In the exploration of new low-carbon and resilient futures there is a focus on changing the underlying system of production and consumption away from a pattern of growth based on increasing scale in long 'linear' production chains, to distributed and networked systems. These involve, an increase in diversity of forms of provision; a greater localisation of points of production, tailored to the diversity of 'locally' available resources (material and social); and a strong network of sharing, linking the local to the regional, national and international.

25-year horizons - to overcome resistance from existing commitments:

Exploring futures around a 25 year horizon is far enough into the future that it draws participants beyond their existing commitments (to policy, intellectual property or business and personal investments, etc); it fits well with the timelines for action on climate change and is generally regarded as long enough for real structural shifts to take place.

Solutions-oriented – focusing on optimistic, desirable futures:

The probable outcomes of a business-as-usual future is often too challenging or threatening for many people who seem ready to deny the science rather than engage with precautionary responses. VEIL aligns with the creative underpinnings of innovation, focussing on the generation of solutions and the projection of alternative futures that are desirable and sustainable; building a movement of expanding optimism.

Visions – not (just) words and data:

To change community expectations away from a future based on the extrapolation of current 'business as usual' is a major communications task. VEIL harnesses the power of 'glimpses' – evocative design sketches that embody a transformation of existing systems, but which still require the active participation of the viewer to co-create the context-specific form in which they might exist.

Plausible trajectories and beginnings – 'revealing' current innovations:

Future visions need convincing narratives of how current social or technical conditions might 'unfold' to create the new conditions; they can provide a 'lens' through which to reappraise the present and reveal appropriate starting points that might be otherwise be 'invisible' because they sit 'outside' the mainstream, or because they are small and 'localised'. Their potential trajectory to the envisaged future is projected as a (visualised) scenario.

ECO-A: TRANSFORMATION IN EXISTING URBAN COMMUNITIES – OVERCOMING THE LIMITS OF 'PDP'.

Socio-technical regimes, the conceptual market and the lived experience of urban life, shape individual, collective and institutional perceptions of what is *permissible, desirable and possible* (PDP). VEIL first addressed the urban crucible as a focus for transformation in 2008 in the design of a new 'eco-city' development in the centre of Melbourne (adjacent to the CBD) on a 'brown field site'. Eight design academics, 200 students and around 60 volunteer professionals proposed a vision that represented a radical shift in thinking away from the previous 'business as usual' (government) plans for the site [VEIL 2009]. The eco-city was proposed as an Ecological Business District (EBD) for Melbourne - a permanent 'expo' of sustainable living and business providing 10,000 people with a resilient and productive neighbourhood with 'super-low' consumption patterns and the production of energy, water and food. Although not all the VEIL vision for that site will be realised as the government takes it to the market, the detailed research underpinning each aspect of the plan and the identification of existing niche innovations coherent with the future visions for the site, gave the proposals a sense of 'grounded blue-sky' thinking that government could not ignore in its final investment for master-planning to bring the development to market [VEIL 2010].

That EBD project exposed two critical, issues that led to the EcoA program:

1. *New, or extant, as a 'target' for intervention?* The stark reality of the post fossil-fuel transition for a city such as Melbourne is that *new* urban development can make only a small contribution to the overall goal of reducing energy consumption and greenhouse gases and resilience. Whatever path the carbon-

transition process takes over the coming decades much of the economy will be directed to re-shaping, re-fitting the *extant* urban environment (buildings, transport and systems of provision of water, energy and food). This brings to the fore the critical issue of how to develop support for transformative change ‘from below’, when the direction of transformation can seem to undermine current life conditions and investments that define the peoples’ sense of the PDP.

2. *Does ‘niche’ innovation have to (pre)exist in a particular place?* This question arose from practice: what if existing niche innovation cannot be identified - revealed - within a selected urban territory? Is it possible to propose or envision - and ultimately to prototype - niche innovations based on extrapolation or adaptation of novel developments that have been identified in other contexts? Can innovative niches be designed and implanted?

During and following the EBD project, extensive consultations with local councils across Melbourne¹¹ were conducted to discuss the relevance of the EBD project to local programs on sustainable development. The long-term visions for Melbourne, including EBD, (collectively known as Melbourne 2032: The City of Short Distances”) were generally received with enthusiasm and exhibitions of that work have appeared regularly at local events across Melbourne. The ‘challenge of retrofit’ became a recurring theme in the discussions; councils reported so many cases where the development and implementations of strategies for urban ‘retrofitting’ aimed at addressing CC challenges - reducing energy consumption and carbon emissions, shifting transport away from the car to walking and bicycling, increasing residential density, recycling sources of water, introducing solar hot water heating, supporting urban food production and so on – encountered significant push-back from particular residents and institutions. The term ‘commitments’ was frequently raised in this context: Proposals were unsupported or actively opposed, because they were perceived as threatening existing commitments – personal, social, cultural, economic, buildings, and so on (Beck’s “life conditions”). Whilst the 2032 visions could be accepted by the community as intriguing, even ‘compelling’ future possibilities, programs aimed at actively progressing towards them met with resistance because they threatened current ideas of the PDP!

Eco-A is (now) a two year exploration of ways to initiate a transformation of a community’s sense of PDP, linking future optimistic visions of transformed urban life to purposeful, designed, niche interventions, that can be implanted with the hope that they will grow towards a trajectory of (rapid) development for a zero-carbon resilient future. The locus is a selected urban domain, spatially defined as a ‘precinct’ (typically a few square kilometres). Multiple niche interventions are the ‘acupuncture points’, designed to ‘re-direct’ the forces that currently define the normal ‘meridian lines’ of development.

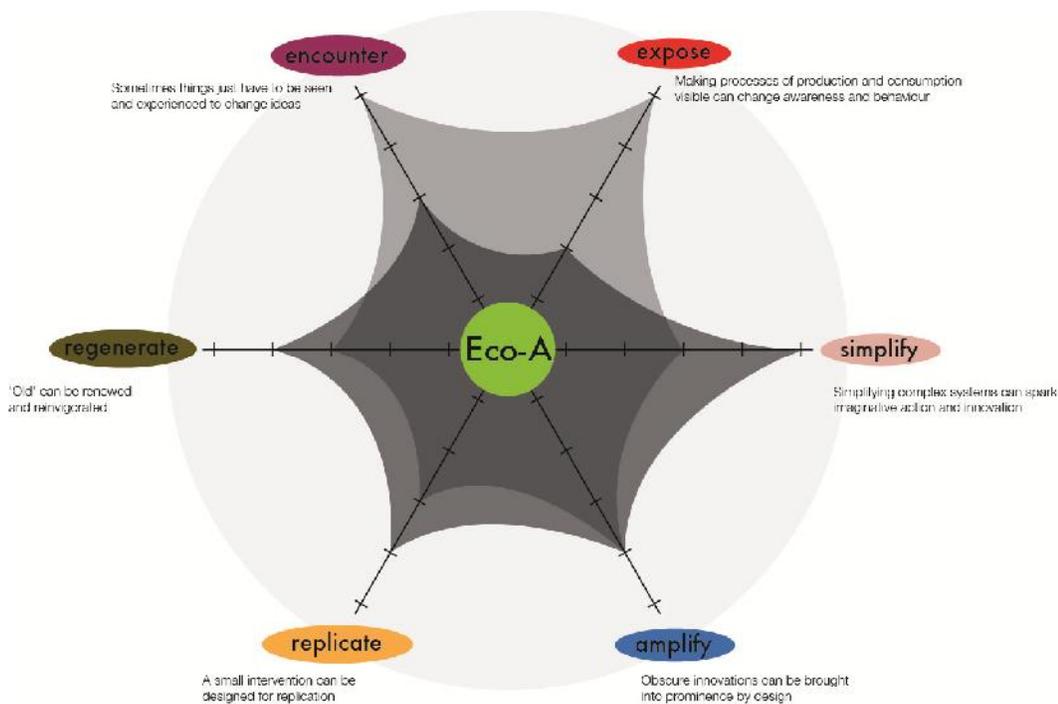
In the first EcoA project with the City of Hume, within the suburbs of Broadmeadows and Dallas [VEIL 2010] a ‘mapping exercise (undertaking by a Melbourne University design studio¹² and staff of Hume city council) reviewed sustainability, climate and resilience issues for the precinct and, using the EBD visions as a guide, sought to envisage twenty-five year transformations that could address the issues found. Many of these ideas were of the kind that had previously elicited some form of community resistance. In a series of workshops and think-tank investigations, conducted publically within the Hume precinct, the specific nature of potential resistance was reviewed.

With that information, the precinct was mapped again to look for sites of *potential intervention*. These sites (many were found) can be thought of as small spatial niches that have little or no ‘attached’ commitments (capital, cultural, social) because of their specific local history: abandoned buildings; parks, waterways and other open spaces, informal thoroughfares, unused crown land, surplus infrastructure space, and so on. These niches are relatively open to novel, innovative design interventions. These interventions should:

- *Be physically observable innovations, that could become disruptive for the dominant regime, in a way that would shift it more rapidly towards a ‘climate proof’ future’ (the interventions should have potential for large systemic effect).*
- *Constitute, together, a distributed network of influence, so that niche changes in any one site connect (conceptually or physically) with another.*
- *Be of low-cost that they can be implemented within the means of the community and their local government, in the near future.*

With the ‘resilience’ framework of distributed systems of provision, EcoA interventions take energy, water, food, transport, information and shelter as the focus for innovation. As the aim of these niche interventions is to maximise their (individual and collective) systemic influence. a set of EcoA approaches to designing has developed (see Fig 2) that is now being used to map different types of interventions for future evaluation.

Fig 2: EcoA design thinking (and proposal mapping)



EcoA developed a series of proposals for the Broadmeadows precinct. Examples include: the diversion of rain-water from the roofs of factories abutting a large open park along a creek escarpment (hot and sun-baked in summer), so that a series of wetlands can be created in the park (with excess water being available for other niche developments); a 'food corridor' linking two ethnic communities with community gardens, food markets and community cooking facilities; the re-development of an abandoned school to create an Aquaculture (fish and vegetable) production facility; the re-use of an abandoned factory as an eco-innovation training centre (linked to the existing and important TAFE college), a "men's shed" and new business incubator; a new set of bike paths to join the above interventions. These concepts and others were exhibited for a week in the now empty Ericsson factory (once employing 6000 people) – itself a site of an Eco-A proposition – where the council (and VEIL staff) conducted a series of guided tours for different community groups (residents, ethnic communities, TAFE education staff, small businesses, and so on).

That exhibition and the tours provided a different form of community consultation about future development possibilities; different because it provided long term visions of future urban changes, as well as possible small, short-term developments *and* because the visions/proposals came from a process and an agency that was clearly seen as independent of the Council or commercial developers. The CC and peak oil context of the proposals was explicit and appeared not to provoke any antagonism.

The impact of the Hume- Broadmeadows process is being monitored. It is in the nature of the process and the community engagement that the Eco-A concepts work on two levels – as explicit small development proposals for the Council and as idea generators for the community, influencing the direction and form of other development processes. The process of monitoring it thus partly tracking the trajectory and progress of ideas. Within the first year after the work was exhibited there are six new community gardens in place, new bike paths and an investigation of the commercial potential of aquaculture. The storm-water re-use proposals should soon become a detailed investigation by a masters student attached to VEIL working with the Council and the relevant water authorities.

The design-action aspects of the program are being extended to other Melbourne communities¹³ and, in a joint project with TU Delft, in a city in the Netherlands¹⁴. The design-research component is being extended by research on future scenarios for food systems in Victoria (jointly with Deakin University and CSIRO: Larsen et al

2011), with further research on distributed infrastructure and resilience and on planning for natural (CC-related) disasters. It is expected to take five years to determine the success of the Eco-A approach.

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¹ *Systems of provision* refers to "all those processes and infrastructures through which goods and services are made available for consumption..... It is used to describe the combination of established industry processes and business practices, the accumulated physical production and delivery infrastructure and the corresponding social and cultural practices, which together define the ways in which life-styles and particular sets of products and services become mutually supporting structures. This includes ... the design, production, distribution and disposal of products and services ... [and] the shared set of expectations and established practices of consumption that affirm particular categories of products and services as 'necessary' for daily lifestyles to function." Ryan C 2002 [41]

² as most authorities predict, even allowing for concomitant reductions in global economic growth from the oscillations of the financial crisis

³ This was the message from the 55 mayors who attended the parallel Mayor's summit during COP 15 in Copenhagen 2009.

⁴ See: www.ecoinnovationlab.com

⁵ VEIL developed from research on the creation of a 'cluster network model' for eco-innovation first proposed in 2002, [Ryan 2002a; 2002b] and developed further in 2004, to provide 'advanced high-risk research into the future' with a creative network 'amplified by a structured connection to design programs within universities' [Ryan 2004:180].

⁶ The Intergovernmental Panel on Climate Change

⁷ For a short summary of 'life-cycle' thinking see: Ryan C 2004 b; or Crul, Diehl and Ryan 2009.

⁸ Categorised under various labels this underlying orientation to the problematic of sustainability was most commonly expressed as: it is possible to find pathways for the future that avoid an oppositional relationship between the environment and the economy, pathways that would (ultimately) bring natural and financial capital into alignment [Hawkin at al 1999 Schmidheiny 1992; Henderson 1996;].

⁹ The term socio-technical (ST) regime is used to describe sets of artefacts, production systems and distribution infrastructure, institutional and professional structures, cultures and practices, (including corporate structures, finance systems, governance, regulations, planning, and so on), that provide a mechanism for stable trajectories of innovation and development.

¹⁰ exposed though its moderated web blog 'SustainableMelbourne.com' and from a global 'observatory'.

¹¹ with the collaboration of ICLEI Local Governments for Sustainability and the Victorian Local Sustainability Accord

¹² Led by Dr Sigh Sitsusinga from Landscape Architecture

¹³ Sunshine in Melbourne's west in 2010-2011)

¹⁴ Not selected at the time of writing.