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Governance for regenerative and decarbonised eco-city regions

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ABSTRACT

Today, world's city populations are growing at an unprecedented rate. Old centralised, city infrastructure networks are under pressure to support the production, distribution and consumption of city resources. New distributed, low and zero carbon infrastructure options are required to reduce global carbon emissions and pollution, and improve the efficient distribution of energy, water and waste products and services. Similarly, new strategies to manage these infrastructure systems are required. Outdated political, economic, and social barriers need to be reviewed to allow city precincts to succeed in reducing their carbon footprint, improve people's lifestyles, and live more harmoniously within the means of the Planet. This paper seeks to uncover some of the barriers, as well as the opportunities that exist for the process of decarbonising cities to succeed. The paper through a series of interviews with professionals from all different sectors of society, aims to shed some light on some of the key issues surrounding the topic of governance and decarbonised, urban development. The work also highlights some emerging business models that demonstrate the type of governance structures that can support decarbonised development within cities and regions.

1. Introduction

The world's cities are growing increasingly larger, transforming into megacities, hosting the densest populations that history has ever known. To support these thriving megalopolises the efficient productivity of resources is required and a resiliency in the distribution of power, water and waste products and services is needed that is more in sync with the environment. Outdated, carbon intensive, city infrastructure systems are struggling to keep up with the pace at which our cities are growing, plus they are contributing to rising global carbon emissions [1]. Humans need a new approach, a new way of thinking, and a new way of looking at how our cities are designed, built and powered. Similarly, city infrastructure systems require new management strategies that support low and zero technology aimed to enhance people's lifestyles and create a cleaner Planet. An opportunity exists to re-imagine, reinvent and reinvest in our cities to restore the Earth's natural balance and ensure a future whereby our children can proudly take over its stewardship [2,3].

This process of namely, 'decarbonisation' will involve redeveloping each urban precinct step by step with a lower carbon footprint. Decarbonising cities requires all socio-political, economic, environment, business and education sectors joining forces to collaborate, share ideas, methods, knowledge and expertise. The urban and climate change challenge will not be solved with one quick fix. Offering up complex, location specific problems, solutions need to be found through communal and creative problem solving at the finer, precinct-scale level. If the world is to make the transition to a 'green' economy, based on a circular flow of resources, then all of society affected by this change should contribute to its transformation to ensure a smooth transition [4].

2. Governance for decarbonised development

2.1. Community stakeholder engagement

Enough talking about sustainability issues has transpired over recent decades; now it is time for greater action. People are ready to move forward from discussing ambitious carbon mitigating strategies to actually following through with carbon reductions and realising decarbonised development within their precincts. An increasing unease over soaring carbon emissions, energy and water security, negligent waste disposal, and rising utility bills has incited a greater interest from communities in the management of their local resources [5]. Parallel to this rising community concern, is municipalities are being given greater autonomy and

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responsibility for the planning and design of their precincts. Because local authorities are not always provided the financial or technical means to accomplish high sustainability goals, building partnerships with the private sector, and civic society is fundamental to strengthening their capacity for delivering decarbonised development [4,6].

The emerging precinct scale market for innovative low and zero carbon development is prompting councils, private enterprises and developers, citizens, banks and other organisations to adopt new roles, and form new governance structures encompassing a diversity of community stakeholders [7]. Traditional consumers are becoming producers and providers of local power, water and waste services run by new types of utility partnerships [4,8]. Municipalities are evolving from facilitators of decarbonised development to in some cases, active participators in the construction, operation and management of low or zero carbon district schemes [9,10]. This escalated participation and vested interest from communities in sharing responsibility and investment in the stewardship of their local resources, raises the likelihood that precinct infrastructure systems built to improve resource efficiency will be better managed in the long-term.

2.2. Improved governance structures

Advanced state-of-the-art technology to reduce carbon emissions in the built environment exists today; however, the question of how to bring it all together still evokes a sense of uncertainty among local government and developers [11]. More clarity is required on: how to manage these new systems; what type of partnerships work; and who should partake and be accountable for their functioning. Much debate surrounds the word governance and its role in decarbonised development. Now more transparency is needed on the type of business models, financial mechanisms, technical tools, and collective intelligence for unravelling solutions for 21st Century urban and climate change challenges.

This paper aims to firstly uncover some of the barriers whether political, economic, social, real or perceived that impede the rate at which decarbonised development is taking place in our society. Secondly, it aims to reveal some opportunities emerging that demonstrate obstacles being overcome with a little intelligibility and creative thinking outside 'the box'. Finally, certain governance models will showcase how renewable energy and low carbon energy district schemes can be managed under an effective governance structure.

3. Methodology

This research was carried out over a period of six months involving interviewing a large range of different people associated with the development industry. They were contacted via email, telephone or in person at meetings and invited to participate in an interview regarding the barriers and opportunities to decentralised, district low and zero carbon energy, water and waste schemes. The people were chosen on the basis of their knowledge and expertise in this field. Various materials were used to seek out candidates including: databases, magazines, newspapers, and by attending various networking events. Out of the 50 people asked to take part in the interviews 95% accepted. This demonstrated an overwhelming high degree of interest from the candidates to 'tell their story', assist with research in the area and be open to criticism. The interviewees ranged from large governmental bodies, state and local government officials, utilities, private companies, associations, Non-Governmental Organisations (NGOs), and various professionals from legal, environmental, and socio-political, economic and cultural organisations to academics.

The interviews were usually recorded using an iPhone microphone app, and were mostly conducted in person face to face or over the phone. In some circumstances the interviews were completed by responding to a series of questions over email. The interviews were fairly informal, taking place over a coffee, and lasting for approximately 30 minutes. The questions were tailored to suit the interviewee, so none were identical. Quite a bit of research was carried out on the interviewee and their organisation beforehand, to prepare appropriate questions that would fit the expertise of the interviewee, in order to extract relevant information in the interview that matched their expertise. For instance, there was no point in discussing with a high level government official in water the impacts and trade-offs of renewable energy schemes. It was better to be quite precise and focused in the questions rather than broad and general. This allowed the interviewee to provide quality knowledge that would otherwise be lost in general conversation about rather broad topics. The more concise the questions were the more informative was the answer. All the interviews were professionally transcribed.

3.1. Aim

The aim of the interviews was to gain greater in-depth understanding of the challenges that people in the development industry are struggling with at this moment of time and transition. It was important to obtain a wide range of viewpoints to provide a balance and objective account of the current debate around centralised and decentralised low and zero carbon infrastructure schemes. Interestingly, it was often towards the end of the interview, that the interviewees started to really open up and provide very insightful information regarding their circumstance and view of the issues surrounding low carbon development.

This information under normal circumstances would be quite difficult to acquire, as a lot of knowledge of business structures and models, remains in-house and not published in public material. Although, the interviews were largely conducted with Australians, regarding issues in Australia, they are also indicative of issues that many other countries are struggling with grasping. The interviewees' voices – their arguments, perceptions, opinions, doubts, fears, hopes and success stories are woven throughout this paper like a patch work quilt, under principle themes that were identified from analysing the interviews as a whole. For the purposes of this paper, not all of the interviews could be presented and the focus remains largely on energy low and zero carbon, district schemes.

4. Value networks theory

A value networks framework is where designated roles are assigned like in any ecosystem, but rather than an environmental one, this in an economic system. The framework involves the relationship manager, the brand builder, the solutions integrator and the component provider roles all joining together to deliver an outcome for the community. Steve Lennon from ARUP suggests that this is also a general way to consider the individual but key pieces involved in creating a decentralised energy solution [13].

The key to this framework, which can be likened to any decentralised system, is determining where is the 'value' accrued to in the network, and a lot of that value is derived and based on where is the market power. According to the theory this 'value' should come down to the systems 'relative value add' to what the overall network is offering the end customer in any kind of share market that involves a producer. This framework provides just a simple way to begin thinking about the necessary bargain that should be getting struck by the participatory entities in the value