

The IDEA Project

World Study Tour

Steering Committee Report

**Prepared for the Participants in the
St Andrews Strategic Co-operation Agreement**

**Department of Premier and Cabinet – Ministry for Planning –
Western Australian Planning Commission – City of Wanneroo
–Tokyu Corporation**

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1.0 EXECUTIVE SUMMARY

This Report on the IDEA Project World Study Tour has been prepared by the Project Steering Committee for the participants in the St Andrews Strategic Co-operation Agreement. Synectics Creative Collaboration of Canberra assisted the Steering Committee in its preparation. Contact details for Synectics Creative Collaboration are set out at the rear of the Report.

The recent Study Tour of the United States, United Kingdom, Europe and Japan by members of the IDEA Project Steering Committee and Synectics Creative Collaboration was planned to maximise the opportunity to learn from leading, international experiences and to make high level contacts for future collaboration. Prior to departing, the Steering Committee undertook extensive investigations into potential destinations to assess their relevance to the St Andrews IDEA Project.

Once the Study Tour destinations had been selected, detailed profiles were prepared to familiarise the Steering Committee members with a number of location's attributes and characteristics. These profiles are contained in **Annex A** to this Report. A set of generic questions, see **Annex B**, was prepared around the aims and objectives of the IDEA Project, and a set of specific questions, see **Annex C**, was prepared for a number of the Tour destination to facilitate discussion.

During the Study Tour extensive written material was collected by the Steering Committee members and **Annex D** to this Report contains a Consolidated Bibliography of Key Publications and Information Sources.

The Study Tour identified a number of key factors that were consistently found in leading and successful, sustainable urban communities.

- The Study Tour destinations had high levels of local employment relative to the population base, however, the numbers of local residents who worked locally were relatively low. This journey to work movement demonstrated a considerable need for efficient and effective regional transport infrastructure.
- All destinations visited had established strong governance structures and policies in areas such as community design, quality assurance, building codes and urban management systems. This strong governance feature – in both public and private sector projects - underpinned the generally high quality outcomes over time.
- With the rise of a knowledge-based society, a community's future is tied to its ability to be a knowledge source and to institutions that generate information. Strong relationships with universities and other pools of information significantly improved a community's capacity for sustainable economic growth.
- Access to quality health, telecommunications and educational infrastructure as well as cultural, recreational and lifestyle assets significantly improved a community's capacity to attract enterprise and economic activity. The provision of these assets within an overall quality urban design framework has potential to provide an enhanced amenity that is conducive to establishing a high productivity workforce.

- Facilitating the development of enterprises and clusters of economic activity were substantially enhanced with the provision of low cost, flexible incubator space with proximity to the pools of information.
- The successful marketing of the community's attributes as a place for employment and enterprise required persistence. In many instances, dedicated personnel carrying out the role of economic development managers proved to be an efficient and effective means for attracting employment to a community or region.
- Diversity in housing, such to meet the needs of all socio-economic sectors of the community, facilitated economic growth. Affordable housing for the lower income members of the community as well as middle and upper income housing provided an urban infrastructure that attracted a balanced workforce.
- The Study Tour destinations clearly demonstrated the benefits of designing and developing urban communities with international focus or orientation. By planning for this international orientation the St Andrews Project will position itself in an important niche market. An international focus will also assist in raising the Project's profile by making it more prominent from a marketing perspective.
- Social benefit cost assessments undertaken in Australia and elsewhere clearly indicate the significant community benefits generated from the incorporation of these key factors when compared to the 'business as usual' scenario of ad hoc, incremental urban growth.

The St Andrews project provides an opportunity to build in factors that greatly enhances the potential for the attraction of local and regional enterprise and economic activity.

The planning and design of the project proposes to incorporate appropriate elements and key factors that have proven effective in the development of sustainable communities elsewhere. The successful implementation of this planning at St Andrews is highly likely to achieve a leading development that balances economic, social and environmental issues and significantly enhances the physical and social capital of the Perth Metropolitan Region.

A number of the Study Tour destinations provided the opportunity to better understand the dynamics of urban development at the scale proposed for St Andrews. It became evident that developments that are well planned in all areas from the start can be capable of generating their own critical mass over time. Once this critical mass is achieved, the developments can generally stand on their own and continue to grow regardless of the initial developer or public planning policies.

2.0 OBJECTIVES OF THE STUDY TOUR

The IDEA Project Study Tour had a number of objectives including:

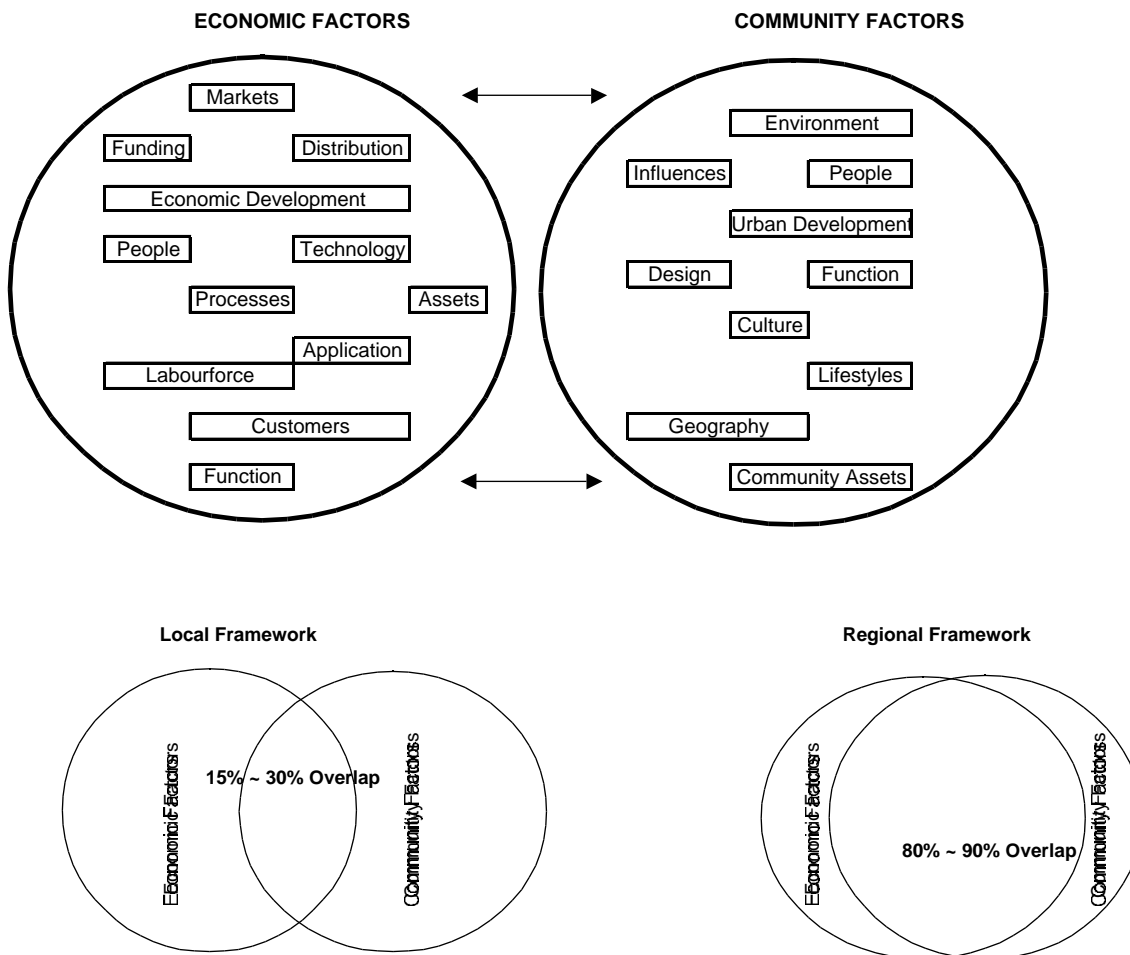
1. To visit international experts who have analysed and consulted to large-scale urban development projects containing integrated economic development components.
2. To visit large-scale urban development projects containing integrated economic development components and learn from their experiences.
3. To study the relationships and linkages between the labour force and employment location within a regional setting.

4. To combine the experience and opinions of international experts with the Steering Committee’s own observations so that the Committee is in a sound position to establish guiding principals for successful development of the St Andrews Project.

The IDEA Project World Study Tour provided opportunities to investigate the inter-relationships between economic factors and community factors that impact on urban development, world-wide. A number of these factors are indicated below in **Figure 1**. At a local level, the overlap between the two spheres can be reasonably significant, i.e. the local community provides many of the economic and community factors, however at the regional level the overlap can be substantially greater.

The Study Tour destinations demonstrated that urban areas with high levels of local employment also require strong regional transport infrastructure systems. At a local level, some 15% to 30% of the local community has the opportunity to work locally, whereas, at a regional level the overlap can increase to 60% - 80% plus. Appropriate transport infrastructure is required to mobilise the regional labour force.

Figure 1: Urban Development Factors



3.0 Study Tour Destinations

The following section provides an outline or abstract of each of the Study Tour destinations, as well as the main contacts made and the key publications provided.

3.1 ICF – Kaiser, San Francisco, USA

ICF specialise in understanding the successful creation of economic development within an urban development context. ICF offers its clients a broad array of services in support of development issues that confront local, regional, and cross-border communities. These services range from designing regional economic strategies that enlist public and private resources, to implementing housing, training, emergency management, and financial plans at the local level.

Increasingly, the success of many development projects depends upon public and private co-operation. ICF specialises in building public-private partnerships that result in improved planning and organisation, better resource allocation, and a mutual commitment that achieves project success.

Their services include the following:

- Regional Economic Development Strategies.
- Urban and Regional Planning and Support.
- Housing and Community Development Program Support and Evaluation.
- Housing Research and Analysis.
- Sustainable Development as It Relates to Economic & Community Development.

They have consulted to developers and governments on an international basis. ICF's methodology concentrates on:

- understanding local and regional competitive economic advantage.
- analysing business processes required for success.
- determining micro and macro implementation strategies using "value chain analysis".
- establishing financial benchmarks for business planning and execution

Contacts Made

Various members of ICF Kaiser.

Key Publications

See <http://www.icfconsulting.com/icfconsulting/home.nsf/pages/ecoindex.htm>

3.2 Collaborative Economics, San Francisco, USA

Collaborative Economics helps civic entrepreneurs, or “Champions” build prosperous communities. Civic entrepreneurs see the opportunity to create great communities for the new economy and act on that vision.

Collaborative Economics staff have assisted civic entrepreneur leaders in more than 35 U.S. states and 10 foreign countries. Collaborative Economics’ unique approach uses collaborative processes to design and implement initiatives for regional economic change. The firm offers a unique blend of worldwide experience and relationships, analytic capabilities, information about world-class economic strategies, and collaborative process skills. A description of success factors and lessons learned from more than a decade of experience -- *Grassroots Leaders for a New Economy: How Civic Entrepreneurs Are Building Prosperous Communities* -- was published by Jossey-Bass in March 1997.

Collaborative Economics’ approach emphasises co-producing results with clients. It acts as strategic advisors to help leaders to spark and sustain efforts to transform their region fundamentally. At every stage of an engagement, Collaborative Economics works with leaders to select and customise products and services that build the local capacity to produce results.

Collaborative Economics specialise in understanding the successful creation of economic development within an urban development context. They have consulted to developers and governments on an international basis.

Collaborative Economics methodology concentrates on:

- establishing public policy support processes required for success.
- implementing organisational and community change dynamics required for a project’s success.

Contacts Made

Doug Henton
Collaborative Economics
350 Cambridge Avenue, Suite 200, Palo Alto, CA 94306
Phone: (650) 614-0230 Fax: (650) 614-0240
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Key Publications

See http://www.coecon.com/meet_cei.htm

3.3 Calthorpe Associates

Calthorpe Associates is internationally recognized for its land planning, urban design, and implementation expertise.

For over a decade, this firm has assisted regions, cities, and private clients in creating pedestrian and transit-oriented communities that foster diversity, promote social interaction, and provide viable alternatives to the private automobile. Their projects range from urban infill strategies and streetscape improvements to station-area designs and transit-oriented suburban activity centres.

Calthorpe Associates specialise in:

- regional planning aspects of containing urban sprawl by integrating employment creation with design of new communities
- project planning which de-emphasises dependency on the automobile together with self-sustaining local economic strategies at the neighborhood level.
- architecture which reflects local history, cultural and environmental values

The firm has been a pioneer in developing the concepts of Pedestrian Pockets, Transit-Oriented Development, and “village” planning. This firm places a special emphasis on fostering neighbourhoods and districts that provide shopping, housing, and jobs within close proximity to each other and transit. Their designs and strategies acknowledge the contemporary needs of the automobile while maintaining their focus on efficient form, ecological sustainability, market feasibility, and community responsiveness.

Calthorpe Associates have consulted to developers and governments on an international basis.

Contacts Made

Mr Peter Calthorpe and various members of his organisation.

Key Publications

See <http://www.calthorpe.com/>

3.4 Cambridge Futures, Cambridge, UK

The *Cambridge Futures Project* was set up since Cambridge and its region are undergoing massive and accelerating change. Proponents have provided an evaluation of seven options on which to draw feedback and comment from stakeholders focussing on questions such as: What kind of place do we want our city and region to become? How will they shape up over the next 50 years?

The proponents are a joint venture between local business leaders, politicians, local government officers, professionals and academics who have been identifying and assessing options for growth in and around Cambridge since 1996. Strong governance within the region is evident in the structured approach to land planning and development.

The *Cambridge Futures* research team is directed by Professor Marcial Echenique and is based at the Martin Centre for Architectural & Urban Studies of the University of Cambridge. Principal participants of Cambridge Futures’ Steering Group: Professor Sir Alec Broers, Vice-Chancellor, University of Cambridge; Councillor John Durrant, Cambridge City Council; Michael Marshall, Chairman, Marshalls of Cambridge.

The Cambridge Futures research team has an ongoing project to analyse urban growth options that may be relevant to St Andrews, including:

- Option 1: Minimum growth.
- Option 2: Urban consolidation.
- Option 3: "Necklace development" allowing surrounding towns and villages to expand.
- Option 4: "Green swap" - building on parts of the green belt but expanding it elsewhere.
- Option 5: Building along public transport routes.
- Option 6: Creating a "virtual highway" with a high-quality electronic communications system.
- Option 7: Creating a traditional new town.

Option 5 – building along public transport routes – was the clearly preferred option, liked by 78% of all public respondents. Some 86% agree that more money should be invested in regional public transport than in roads. In addition, 59% agree that commuters should pay to drive their cars into Cambridge, inferring that there is substantial support for road tolls but these would have to coincide with the provision of good public transport alternatives if they were to have impact on traffic congestion in the city.

The research team recently incorporated as Marcial Echenique & Partners Ltd (ME&P) to apply the land use assessment tools developed for the Cambridge Futures project to other urban development projects in the UK and Europe. The team has developed the MENTOR land use model to estimate the pattern of location of households and employment within areas of investigation.

It also estimates the spatial linkages between various activities such as journeys to work, to shop and to other services. The resulting pattern of linkages between activities gives rise to the demand for transport, placing the conventional transport modelling steps of trip generation and distribution on a firm economic basis.

The MENCAM (MENTOR integrated model of the Cambridge Sub-Region) land use model covers the 108 wards within the sub-region.

Contacts Made

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Key Publications

Cambridge Futures, University Press, Cambridge, 1999. ISBN 0 9535530 00

Cambridge Futures Survey Report, Revised October 1999, Cambridge Futures, Cambridge Architectural Research, and Cambridge Media Lab.

MENTOR and MENCAM Model of the Cambridge Sub-region, Version 2.1, September 1999, Marcial Echenique & Partners Ltd

Cambridge Futures, Exhibition: Options for the Future of the Cambridge Region, Form for "Public to Voice their Views".

See also <http://www.meap.co.uk> and <http://www.arct.cam.ac.uk/cambfut>

3.5 Mill Creek, Seattle, USA

The purpose of this visit was to establish planning, environmental and quality standards that Tokyu has used in its own urban developments that may parallel intended elements of the St Andrews project.

Located 30 kilometres north of Seattle, Mill Creek is a successful residential development with more than 7,500 people in 440 hectares of land. It was commenced in 1973 as a joint venture with Tokyu and Obayashi and is currently managed by United Development Corporation owned by Tokyu companies. The project includes golf courses and a shopping centre. The city has four developed parks, totalling 12.5 acres and three undeveloped parcels totalling 24.75 acres. The city's parks department has ongoing programs for children and adults. It is known as one of the best residential developments around Seattle. This has resulted from the strong governance within the development in relation to urban design, quality assurance and building codes.

Mill Creek is primarily a residential community. On the surface most of its businesses appear to be supermarkets, convenience stores, restaurants, dry cleaners and other sorts of residential oriented services. However, of the city's total 248 registered commercial enterprises in the city, 148 are registered to in-home businesses.

Although reasonably close to Seattle, Everett is considered "downtown" by most Mill Creek residents. Most commute to work to larger metropolitan areas such as Everett, Seattle or Bellevue (and the Eastside).

Of the employment in Mill Creek and its surrounding unincorporated urban growth area, almost 85 percent of employment is in retail and service oriented jobs. About 3 percent work in manufacturing, 3 percent work in wholesale /transportation /communications/ utilities, with the remainder in government and education.

Mill Creek is host to a number of community events throughout the year, including a children's Easter egg hunt, the infamous "Run of the Mill" footrace, an elegant summer concert series and a community Christmas Tree Lighting. In May and October, citywide garage sales draw more than 10,000 people from surrounding areas to Mill Creek.

Contacts Made

Various members of United Development Corporation.

Key Publications

See <http://www.northshorecc.org/ncc/millcreek/economy.asp>

3.6 North West Landing, Tacoma, USA

Northwest Landing is a 3,000-acre planned community being developed by Weyerhaeuser Real Estate Company in the Western Washington Community of DuPont.

The primary goal in development is to create a cohesive community that successfully balances a variety of land uses.

The development plan to be undertaken over the next twenty to thirty years includes residential, municipal, community, retail, commercial, and industrial uses, interspersed with neighborhood greens, parks, pedestrian trails, areas of open space, and wildlife/natural habitat areas.

It is anticipated that nearly 8,600 jobs will be created within Northwest Landing, and that as many as 10,000 people will be attracted to the approximately 4,000 single-family, condominium and apartment homes planned for development.

The site is located on Interstate Highway #5 between Tacoma and Washington and is 45 minutes driving time from either city. The master plan for North West Landing contains 150 acres of office development and two "Main St." areas. A common village green serves as a comfortable public space. Neighbourhoods range from traditional single family to alley served cottages, each with a small mini park.

Intel has chosen the site for a 185 acre, \$250 million campus for computer assembly, research and development. There are currently 1,600 people working at the Intel complex. Also, Intel recently announced a \$10 million "Enterprise Technology Center" they are building in the DuPont campus with nine other computer makers to help Intel design better computers.

State Farm Insurance have approximately 850 employees who are located in a 364,000-square-foot brick office building on 52 acres facing Interstate 5 and Mount Rainier. The office serves agents and policy holders in Washington, Idaho, Montana, Alaska and Hawaii.

Employment self sufficiency at the project is ultimately, geared toward an exceptional 200 % goal. This strategy is possible due to the regional transport links via the Interstate Highway.

The site itself is of only average quality. It has been designed to minimise regional commuting through two strategies. The first being employment creation by attracting a diverse range of employment opportunities. The second is to attract homebuyers who wish to be located close to employment sources.

While the project caters to a broad range of socio-economic demographics, its main success is related to its Interstate access and the provision of high quality affordable housing using “new urbanist” principles of community design and construction through strong governance. Absorption of affordable housing products is in excess of 240 units annually well ahead of better located but conventionally designed projects nearer to Washington and Tacoma.

Contacts Made

Various members of the Weyerhaeuser Real Estate Company.

Key Publications

See <http://www.nwlanding.com/general.html>

3.7 The Woodlands, USA

The Woodlands, Texas is a forested, 25,000 acre (10,100 ha), master planned community consisting of residential villages, commercial developments, schools, churches and extensive recreational amenities. Planning for The Woodlands commenced in 1970 with the first land sales in 1974.

When completed in the next century, The Woodlands will be home for an estimated 150,000 people in 52,000 residences. Plans call for 82,000 jobs, 3,100 employers and retention of approximately 25 percent of the community's 25,000 acres in forest preserves, parks, golf courses, lakes and open spaces. Notwithstanding an employment ratio of 60% to 70%, only some 30% of The Woodland's residents work on-site.

Access to Houston is via a freeway and a toll way. These transport networks enable the regional labour force to commute to the on-site jobs and provide easy access for The Woodland's residents to employment in Houston.

Ian McHarg of Philadelphia, author of "Design with Nature" and considered by many to be the father of the US environmental movement, was in charge of environmental planning. William L. Pereira of Los Angeles, whose achievements include planning new towns in the United States and abroad, concentrated on planning and design. Other widely recognized leaders were retained for economics and marketing, engineering and liaison with government agencies. This strong governance has continued throughout the development in the form of building covenants and codes, quality assurance and high levels of urban design.

The Research Forest currently contains over 32 entities employing more than 2,000 people, including more than 300 PhD's. It includes the Houston Advanced Research Center with more than 200 people employed and 40 separate research projects and a number of large corporations. The Research Forest also has a 100 acre (40 ha) campus with affiliates at nine major U.S. universities and research institutions.

Many of the Planned Urban Developments and master planned developments, particularly those in the south east and south west of the United States have modelled components of their development on The Woodlands. Examples include Las Colinas, a 12,000 acre (4,850 ha) development located within the City of Irving, between Dallas and Fort Worth, McCormick Ranch, a 4,200 acre (1,700 ha) development in Phoenix, Arizona and Weston, a 10,000 acre (4,000 ha) development adjacent to Fort Lauderdale, Florida.

Contacts Made

Steve McPhetridge, Vice President Commercial sales, Leasing and Land Development. The Woodlands Operating Company, and Tony Dawson, Vice President of Hospitality. The Woodlands Operating Company.

2001 Timberloch Place, P.O. Box 4000, The Woodlands, Texas 77380.

Tel : 281 719 6151

Fax : 281 719 6181

Key Publications

- A Brief History of The Woodlands
- Detailed Plan of The Woodlands
- Brochures on various buildings including the Ventures Technology Center, Waterway Plaza, the Town Center.
- Marketing material for The Woodlands as a place to live, work and recreate.

Key Publications

A Brief History of The Woodlands, The Woodlands Operating Company, LP

Detailed Plan of The Woodlands, The Woodlands Operating Company, LP

Brochures on various buildings including the Ventures Technology Center, Waterway Plaza, the Town Center, The Woodlands Operating Company, LP

Marketing material for The Woodlands as a place to live, work and recreate, The Woodlands Operating Company, LP

See <http://www.thewoodlandsusa.com/>

3.8 Peterborough, UK

Peterborough is located 1.5 hours driving time north of London. Being on a main north-south rail corridor it provides a 45-50 minute commute time to the London. Peterborough is one of 8 “New Towns” circling London, which were commenced in the 1950’s in order to contain urban sprawl and provide housing for an exploding regional population. Containing 80,000 residents it is a classical example of “New Towns” executed by “top down” strategic planning favoured by the socialist British Government of that time.

The project took 30 years to complete and has achieved 70% employment self-sufficiency in the region by reorienting its employment base to leverage rail and road connections to London and easy access to Europe.

A key feature of the project is the early implementation of a transit-oriented retail shopping mall that was used to redevelop an existing town centre. Perhaps the strongest feature of the development was business planning which aggressively targeted businesses for relocation to the project in order to capitalise on cheaper housing and labour supply made accessible by an excellent rail service between Peterborough and London and towns *en route*.

The historic nature of the original city of Peterborough (circa 900 ad) has been retained with effective building codes and urban design requirements enforced by the New Town Development Board. The success of this governance was particularly evident in the development of the mall adjacent to the Town Square and Norman Cathedral.

Contacts Made

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Former Chief Executive
Peterborough New Town Development Corporation
8 Westwood Park Rd.
Peterborough PE3 6JL
Tel: 44 (0)1733 564399
Fax: 44 (0)1733 893952

Key Publications

Peterborough, The Greater Peterborough Partnership.

Greater Peterborough Investment Agency, Greater Peterborough, 1999.

Profile, An update publication of the Greater Peterborough Investment Agency, issued quarterly.

See <http://www.peterborough.net/gpia/index.htm>

3.9 Cambridge New Town Corporation

The "Cambridge phenomenon" has come to parallel Silicon Valley: it has become a worldwide image or symbol of the innovative milieu. Cambridge as a high-tech centre is essentially a creation of the 1970's and 1980's and represents genuine entrepreneurial, new firm-based growth, based on computing, scientific and electronic equipment, and increasingly biotechnology - which had spun off from university research.

With this economic growth has come increased pressure for urban development and the problem is so serious that proposals have been made for Britain's first large new town since 1970 to soak up the growth. The government is generally against new towns, but may accept one near Cambridge if it can be shown there is no alternative.

Proposals to build a new town for 50,000 people outside Cambridge were unveiled in October 1998 and if it is approved it will be Britain's first new town since 1970, and the first to be privately funded since the second world war.

The scheme, promoted by Peter Dawe, a multi-millionaire internet entrepreneur, adds a fresh dimension to the debate about where to put 4.4m new households forecast for creation in England between 1991 and 2016. It coincides with proposals by Sir Peter Hall, a leading member of the government's urban taskforce, for three "social cities" of up to 250,000 people to be created 50 to 90 miles from London. One of these is for the proposed *City of Anglia* connecting Peterborough, Huntingdon, Cambridge and Stevenage with high quality regional public transport links servicing complexes of urban villages of 10,000 to 20,000 residents.

Cambridge New Town is proposed to grow to 45,000 residents by 2016 and 160,000 by 2051 - larger than Cambridge, which has 109,400 and constituting much of the growth projected for the proposed *City of Anglia*.

Contacts Made

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E-mail: contribution@c2.org.uk

Inaugural chairman Peter Dawe has passed chairmanship to Wyndham Thomas, vice-chair Town and Country Planning Association (chaired by Sir Peter Hall) and former chief executive of Peterborough New Town Development Corporation.

Peter Dawe, founder Unipalm Pipex, the UK's first internet service provider, was recently appointed to membership of the Regional Development Agency for East Anglia by the Secretary of State for the Environment.

Key Publications

See <http://www.c2.org.uk>

3.10 Cambourne Business Park

The Cambourne Business Park is being developed by Development Securities PLC, a major London-based property developer. The Business Park has no commercial links with the adjacent housing in three "urban villages" that is being developed by three housing companies. One of the housing companies is McAlpine Homes. Lord McAlpine is also a director of Development Securities PLC.

When fully developed, the Park will provide 750,000 square feet (70,000 m²) of top class office and enterprise accommodation. It is located with immediate access to a motorway link to Cambridge and the wider region.

The Cambourne Business Park site is subject to zoning that permits office, R&D and light industrial uses. Two buildings are under construction.

- An office block of 9,200 m² of which 2,700 m² which has been pre-let to the Regis Business Centre Group and three expressions of interest had been received for 2,000 m² to 4,500 m².
- A mixed use building of 2,700 m² which is being built speculatively.

Development Securities PLC is a risk-averse company but its Directors recognised the need to 'prime the pump' and put some space on the market to attract attention in this new development.

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3.11 The Merkur Bank and Gaia Trust, Denmark

Established in 1982, the Merkur Co-operative Bank has been instrumental in securing the essential capital and financing for more than 500 social and ecological initiatives and projects, throughout Denmark and abroad. Each enterprise makes up a piece of the puzzle towards a more sustainable society. Included are: schools and kindergartens, homes for the mentally handicapped, educational institutions/museums, student grants, doctors and the health care, trades and businesses, alternative energy systems, village co-operatives, co-housing co-operatives, bio-dynamic farming, ecological small-holdings, and many others.

A public co-operative bank, it aims to make banking a transparent business. Customers exert an influence as to how their money is being worked with and they are kept informed of the process. Customers are offered the opportunity to become joint owners. Close to 50% of customers have accepted this offer by buying one or more shares at 1000 kr each.

The *Gaia Trust*, founded in 1987, is a Danish charitable co-operative society financing sustainable technologies and ecological projects of demonstrable value through the *Global Eco-village Network* (GEN) and *Gaia Technologies A/S* referred to as *Gaia Tech* established in 1993 in collaboration with the Merkur Bank.

Gaia Tech is a commercial venture capital company with the objective of supporting the development and marketing of ecologically sustainable businesses in Denmark. Of particular interest are businesses which in the long run are suitable to eco-villages and which provide jobs for the inhabitants of these settlements. The company supplies active financial, legal and marketing support to young, promising, green businesses. The focus is primarily on businesses that work toward a cleaner environment, reduced use of natural resources, production of environmentally friendly products, and using environmentally friendly means of production.

Gaiacorp Ireland, part of the *Gaiacorp* group of companies, is independently owned by *Gaia Trust*. *Gaiacorp* is a currency management company established in 1988 to advise on and manage foreign exchange exposure for international institutional investors. Marketing and trading take place in the International Financial Services Centre in Dublin and offices in London and Hong Kong.

Gaia Trust has provided grants through GEN to over 80 projects in 20 countries. It has developed a proposal for funding of \$US100 million to be allocated to an international United Nations committee for the support and development of from 50-70 small eco-villages (up to 2,000 inhabitants) in both urban and rural areas across the globe. The primary objective is to establish successful examples of sustainable living in the 21st century, with the intention of providing models for replication.

An important eco-village issue is how to make technology ecologically, socially and spiritually responsive to human needs, rather than the opposite. A closely related issue is the creation of jobs in eco-villages. Technology tends to determine the structure and organisation of society. Contemporary society's technology promotes unliveable megacities, separation of work and home, institutionalisation of family support functions, environmental degradation, unsustainability, and over-consumption, in a centralised, hierarchical structure.

The GEN vision requires a radical change in structure that would reverse these tendencies. An important part of GEN's strategy is the promotion of sustainable technologies. The long-term vision is to provide sustainable jobs in eco-villages by technology exchange and co-operation. Three key criteria have emerged in assessing appropriate technologies for eco-villages, over and above commercial viability:

- Ecological sustainability.
- Human-scale, decentralised production.
- Allowance for a non-stressful, meditative lifestyle. It is recognised that the realisation of this vision will take some time.

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Gaia Trust and the Global Eco-Village Network

The Earth is Our Habitat, A proposal for a Support Programme for Eco-Habitats As Living Examples of Agenda 21 Planning, Gaia Trust and the Global Eco-Village Network, June 1996.

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3.12 Kalundborg, Denmark

One of the most advanced working examples demonstrating industrial ecology is the flow of resource and by-products between participants in a pioneering industrial ecosystem at Kalundborg, 100km west of Copenhagen in Denmark. The motorway and railway links between Kalundborg and Copenhagen have provided Kalundborg ready access to professional engineers, scientists, technologists that choose to live in Copenhagen and smaller communities *en route* throughout the region.

This industrial symbiosis has attracted a great deal of international attention and has been awarded a number of environmental prizes. Kalundborg provides an excellent case study of the benefits that flow from the application of engineering input to environment industries.

The development is not the result of a careful planning process but rather a result of a gradual development of co-operation between four neighbouring industries and the municipality of Kalundborg. From the initial stage where things happened by chance, this co-operation has now developed into a high level of environmental consciousness, where the participants are constantly exploring new avenues of environmental cooperation.

This evolution has led to a co-operation between different industries, by which the presence of each of them increases the viability of the others, and by which the demands from society for resource conservation and environmental protection can be taken into consideration.

Through 1993, the \$US60 million investment in infrastructure (for transport, energy and materials) has produced \$US120 million in revenues and cost-savings.

An insight can be gained into this successful cooperation by summarising the various characteristics leading to the innovative outcome at Kalundborg. These have been identified as:

- Industries involved in the cooperation must be different but fit together.
- Individual industry agreements are based on commercially sound principles.
- Environmental improvements go hand in hand with resource conservation and economic incentives.
- Cooperation is voluntary and in close collaboration with regulatory agencies.
- Short physical distances are an advantage.
- Short mental distances are critical.

The emergence of eco-industrial infrastructures has been characterised by the following continuum:

1. Compliance.
2. Partial recycle initiatives.
3. Development of environmental management tools.
4. Highly developed closed-loop recycling.
5. Significant changes in products and packaging.
6. Environmentalism fully integrated in corporate culture.
7. Synergistic industrial ecosystems developing.
8. Full industrial ecology.

This case study of Kalundborg shows only the tip of the iceberg of the wide range of environmental applications that can assist industry, commerce and the wider community. These technical solutions, put to use in the growing world market for environment products, many of which are virtually on our door step, provides a tremendous opportunity for many parts of Australia including the clustering of enterprises that will operate from St Andrews.

Given the heavy industry nature of Kalundborg, the key scientists and technologists required to make it work over the years have been able to do so from a choice of city living and rural communities as well as from the charming setting within and surrounding the Kalundborg region itself. This has been due to the motorway and the rail and road links between Copenhagen and Kalundborg.

Within the time scale of the St Andrews project a similar situation could occur between Perth and development at Breton Bay about 100 kilometres north of central Perth. In this case St Andrews may provide many of the technologists and other professionals that would be required to achieve similar industrial symbiotic outcomes at Breton Bay, given a rail link and improved road access.

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3.13 Sophia Antipolis, France

Sophia Antipolis is an international business/science park near Nice on the Cote d'Azur. It was initiated in 1969 and now houses more than 1,000 enterprises, over 17,000 engineers and technicians and 5,000 researchers. Over 2,000 families live in Sophia Antipolis and 40% of its residents work in the Park. The remainder of the labour force reside within the region and travel to work via the extensive transport network of Autoroutes and freeways.

Its main activities are R&D in technology, science and commercial services. An extensive telecommunications system and access to local airport and motorway connections support networking with the rest of Europe. Industries represented include:

- Information Technology
- Life Sciences
- Energy, Environment and Engineered Materials
- Universities and Research
- Manufacturing and Services
- Professional Corporations
- Retail Trades, Personal and Commercial Services

Sophia Antipolis was the brainchild of Pierre Laffitte, then the Deputy Director of the Ecole Nationale Supérieure des Mines de Paris. "Why not set up a "Quartier Latin" in the country?" was the focus of a 1960 Le Monde article written by Laffitte. He had a vision for a city of science, culture and wisdom, to be created on the plateau of Valbonne – the only significant developable site on the Cote d'Azur, which up to then had lacked access and basic services.

Since its commencement, on-site employment has grown to more than 17,000 engineers and technicians and more than 5,000 researchers. These people are employed in over 1,050 companies. Development is controlled by a syndicate of public and private stakeholders who ensure high quality through the application of strong governance in urban design, quality assurance and building codes.

It is claimed the existence of Sophia Antipolis has been directly responsible for the creation of over 30,000 jobs in the local region and that more than 100,000 jobs (over 10% of the entire workforce) of the region are connected in one way or another with the Park. The excellent transport networks within the region have facilitated this economic growth.

In the 1980s certain multinationals – IBM, TI, Digital Equipment, Rockwell International, Cird Galderma, Wellcome, Allergan, AT&T - chose Sophia Antipolis to set up research and production facilities, as well as French and European Headquarters. The presence of these trans-nationals continues to attract new business and research centres.

Employment growth came close to eighteen percent on the site in 1989. In spite of the recession and international upheavals wracking western economies since the early 90s, Sophia Antipolis has continued to generate a positive balance sheet in employment and business start-ups. Much of this is due to the vitality of small businesses.

In Sophia Antipolis, public higher education and research is built around the needs of business. Children ranging from 10-18 years from 73 countries study an international curriculum in the schools of Sophia Antipolis. 2,500 students and 4,000 public and private researchers carry out their work at the Science Park.

The high level of skills, the international renown of the research teams, and the performance of the businesses themselves has led to the establishment of centres of expertise. These centres have developed very specific training programs that are unique in their class.

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Sophia Antipolis: A Unique path for telecommunications, TELECOM 99, Geneva, October 1999

See <http://www.saem-sophia-antipolis.fr>

3.14 Kansai Science City, Japan

Kansai Science City (KSC) is being developed in the Keihanna Hills (which extend over Kyoto, Osaka and Nara prefectures) within a 10 to 30 kilometre radius of these cities, constituting the centre of western Japan. KSC's aim is to promote not only the natural sciences, but all the inter-related activities of culture, academic research and industry, including the humanities and the social sciences in cooperation with industry, academia and government.

The Keihanna Hills where KSC is under construction are noted for their abundant nature and rich cultural heritage as the cradle of Japanese civilisation. This unique and central location means that KSC has been able to establish close ties with the major science and research parks of the Kansai region with the construction of Kansai international Airport. KSC also has convenient access to major cities around the world.

The purpose of the KSC project is to develop and organise Culture and Scientific Research Districts; a group of twelve new districts in an area of approximately 15,000 hectares, where the three prefectures of Kyoto, Osaka and Nara meet.

By this development method, in which the area is divided into a group of small districts, harmonisation with the natural environment and the local communities is made possible. In this way a step-by-step plan of development is also reachable.

Each district developed will form an autonomous city with high-level amenities and manifold functions to facilitate research and study, living, work, learning, interaction and play, and will be integrated, by a regional transportation and information network, into an organic whole.

The high quality road and rail links operating between Kyoto, Osaka and Nara are being emulated by similar links to and between the main centres of activity and supporting communities throughout Kansai Science City. This transport network facilitates the movement of the skilled labour force throughout the region.

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3.15 Tama Garden City, Japan

Tama Garden City, planned and developed by Tokyu Corporation, is a spacious city nestled among the hills and spans an area of 50 million square metres.

Tama Garden City, which is the general name given the area that lies between Kajigaya and Chuo-Rinkan railway stations on the Den-en Toshi Line (a major regional transport spine), is a composite residential community that lies over an expanse of luscious green hills next to Tokyo's south west region. Tama Garden City is just 15 to 35 kilometres to central Tokyo and spreads over the metropolitan city of Machida, and the cities of Kawasaki, Yokohama and Yamato in the Kanagawa Prefecture.

A population of approximately 500,000 reside within Tama Garden City. This development began in 1953 with the announcement of its fundamental concept, the development has continued to the present based on the principle of "the creation of a truly prosperous, human-oriented urban community". It is an urban centre that constantly remains one step ahead of the times as a composite city in a brand-new era that strives to ensure a peaceful coexistence between nature and society.

The urban development of Tama Garden City relied on the support and co-operation of local residents for success in the implementation of land readjustment projects, and it was carried out in conjunction with the construction of the new railway line.

Tama Garden City is one of the largest private sector urban development projects ever undertaken in Japan. The planning and implementation of Tama Garden City was not limited to the mere development of residential lots, but provided for the overall enhancement of the region's functional efficiency. Tokyu play and important role in the provision of urban infrastructure including public transport, retail facilities and Cable Television.

Rather than allowing for private corporations to come in and develop the region on their own, land readjustment procedures utilising urban development methods were implemented with the cooperation of local organisations, and construction of the Den-en Toshi Line, which serves as the primary means of transportation within the region. In parallel, residential development also occurred.

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Large scale colour plan of Tama Garden City

See <http://www.tokyu-group.co.jp/tg/outline/eprofile.html>

4.0 WHAT TO DO

This section synthesises the positive findings from the Study Tour that could be successfully incorporated into the strategic planning for the IDEA Project. The focus is on actions and outcomes that proactively foster the attraction of employment at St Andrews through investment attraction and the development of appropriate enterprise clusters.

4.1 ICF – Kaiser, San Francisco, USA

The processes successfully applied by ICF are based on traditional and proven US Business School methodologies. The processes provide a good means to deconstruct planning for ‘end to end’ employment clusters, i.e. across all production factors from inception to marketing and distribution. A number of processes are applied by ICF including Value Chain Analysis and Gap Analysis.

Value Chain Analysis and Gap Analysis are processes to establish what, if any, elements are missing from a business’s strategic business plans and implementation plans. This approach maps the formal process of business and enterprise development to what outcomes the client is seeking to achieve.

Any differences, or gaps, are identified for further assessment and investigation to ensure all relevant aspects are fully addressed.

As the strategic planning for St Andrews progresses, the application of Gap Analysis would provide an important component of risk management.

4.2 Collaborative Economics, San Francisco, USA

Collaborative Economics have demonstrated a successful approach to addressing the social aspects of organisational and community change dynamics required for a project’s success.

Their approach is to favour smaller scale, tight clusters to optimise the social fabric within urban and regional developments. An important element in developing a sustainable community is the empowering of the local community, both public and private sector

A key factor identified by this organisation was that, increasingly, areas and regions seeking to foster employment generation look only to hi technology options. However, Collaborative Economics stress the importance of not over looking other options as regions can have a strong competitive advantage in lower technology options.

Collaborative Economics also identified another key factor relating to the importance of a project having a ‘local champion’, also referred to in the US as a ‘civic entrepreneur’. In the great majority of Study Tour destinations the success of the project was directly related to an individual who persisted in the face of adversity.

These ‘local champions’ came from both the private and public sectors.

4.3 Calthorpe Associates

Peter Calthorpe’s work clearly demonstrates the importance of the inter-relationships between the social elements of a community, and its urban design, employment and cultural elements.

It is interesting to note these features underpinned Ebenezer Howard’s Garden City concept published in 1898.

Howard's work outlined a 'Social City' with a cluster of mixed use units designed for easy access on foot or bicycle, and connected each to the other by a light rail system.

The message emanating from discussions with Calthorpe Associates reinforced the importance of building a city that can take account of the changing nature of the community over time. The importance of life cycle management should not be overlooked.

4.4 Cambridge Futures, Cambridge, UK

Computer model-based evaluations of the seven options for managing urban development to accommodate rapid population, employment and knowledge-based industry growth in the Cambridge sub-region have been expressed in a highly quality publication and a professional website presentation.

The results of the computer simulations of the options have been succinctly expressed in a well-designed survey for the purpose of obtaining public feedback on preferred options and preferred characteristics of growth. Written (41%) and computer-entered (50%) responses were obtained in a major shopping centre following the presentation of a video designed to provide a broad appreciation of the computer-generated results. Public responses were also obtained via the Internet (9%). This was supported by the website established by *Cambridge Futures*.

Cambridge Futures purportedly operates independently of specific development interests. It is realised that further assessments of options are likely to comprise a mix of the existing seven options.

Ongoing public input on the assessments of options will be obtained, published and used to structure further assessments. Monitoring assessments and planning related to the improved public transport networks and links within the Cambridge region will be important for the St Andrews Project.

4.5 Mill Creek, Seattle, USA

The Mill Creek development did not provide any guidance in respect to employment generation and enterprise investment attraction for the St Andrews Project. However it did provide clear evidence that a well planned, quality urban project, notwithstanding its isolation, is very marketable and can be a financial success for the developer.

In this part of the United States, purchasers seeking high quality of lifestyle outcomes will readily commute some distance from home to work given good regional transport networks.

From an urban design perspective, Mill Creek demonstrated that the provision of improved telecommunications and other urban infrastructure, in association with strong building controls via the community association, can lead to a very successful community development.

Mill Creek provides an example of a quality residential development with high environmental standards that provides a quality lifestyle. This typifies Tokyu's developments and therefore, Mill Creek provides a benchmark for future Tokyu development, including St Andrews.

4.6 North West Landing, Tacoma, USA

The success that North West Landing achieved in attracting significant employment resulted from a combination of three main factors: A prompt development approval process (Intel), chance (State Farm Insurance) and cheap land on a good regional transport network (Intel and State Farm Insurance).

Strong sales and marketing of the St Andrews project will maximise the potential for it to attract 'chance' opportunities over time.

The application of speedy approval processes for development and building applications would assist in facilitating an environment at St Andrews that was conducive to enterprise attraction. This is particularly the case for enterprises that have a short period to get their products and services to market, such as IT.

North West Landing utilised an internet based approval system that streamlined the process and significantly reduced the approval timeframe. This process has been applied in Australia at BHP's Steel River site at Newcastle, NSW where a 28 day approval process is in place.

The price of the land at St Andrews relative to other Perth alternatives is an unknown quantity as yet.

The North West Landing development also demonstrated how a rather uninteresting site can be developed with good urban design to achieve a quality outcome in a low end market product. This relies on strong governance in areas such as urban design, building codes and quality assurance.

4.7 The Woodlands, USA

The Woodlands demonstrated the importance of persistence in attracting and retaining employment activities. It provides a case study of how to work around the inability to attract a university by going directly down the value chain to the source of the information, i.e. the researchers or operators.

The Woodlands also demonstrated how the provision of low cost, albeit small, incubation facilities can improve the attraction of emerging or entry level enterprises to a specific location. This approach also assists in the overall marketing and public relations for the development.

This development clearly showed that the establishment of a new community with substantial residential and commercial activities takes time. To be successful, the cycle of development should show significant progress within a generation. The availability of 'patient money' through development 'ups and downs' was an important component of the project's success.

Affordable housing was provided for members of the community employed in the lower socio-economic activities. This housing is owned and operated by The Woodlands. Welfare housing was not supplied.

This large-scale development has been successful from a combination of actions including a significant, sustained commitment to marketing over the long term, good regional transport networks to Houston – both freeway and toll way, the development of a quality amenity reinforced by strong covenants, and the developer maintaining control of the development.

The regional transport networks underpinned the 60% to 70% employment ratio in The Woodlands. Approximately 20% to 30% of those employed on-site live in The Woodlands with the balance commuting from Houston and the region daily.

As the Woodlands has matured, the development had the in-built flexibility to adapt to changes over time. Initially designed as a low-rise development, the current market is moving towards the economic feasibility of medium to high rise commercial fronting the major transport arterials. This maturity enables The Woodlands to layer its developments to optimise the benefits to enterprise and the community.

4.8 Peterborough, UK

While one of the UK's thirty 'new town' developments, Peterborough has been regarded as among the most successful. This is due to a range of factors including:

- Good rail and road links to London (45-50 minutes) and to the surrounding region provide major attractors for service centre industries, such as the UK headquarters of many European companies and some global companies, and to facilitate commuting to work between Peterborough and London.
- Maximising the community benefits to be leveraged from the existing town of Peterborough, best exemplified by the impressive integration of a modern undercover shopping mall complex behind an existing downtown shopping row fronting a pedestrian friendly centre adjacent to its renowned Norman Cathedral. Strong levels of highly controlled governance enabled this to be successfully undertaken.
- The highly effective use of established clubs, personal linkages and associated networks by Wyndham Thomas, former chief executive of the Peterborough New Town Development Corporation.

4.9 Cambridge New Town Corporation

The Cambridge New Town Corporation (CNTC) initiative comes at a time when enlightened public sector players are reportedly involving the private sector in planning for new cities, particularly in the rapidly growing Cambridge sub-region and a number of other sub-regions within 60 minutes by rail from London. Access to an efficient and effective transport network was an essential element of the economic growth of Cambridge.

Recognising adverse public opinion concerning the effectiveness of the new town program of the sixties to eighties, the UK Government is feeling its way forward. Among other things it is involving prominent industry players in its regional development agencies.

As an example, the Internet entrepreneur and inaugural chairman of CNTC, Peter Dawe, was recently appointed to membership of the Regional Development Agency for East Anglia by the Secretary of State for the Environment. This resulted in Wyndham Thomas taking on the chairmanship of CNTC.

Accordingly, the emerging implementation of the agreement between the Western Australian Government and the Tokyu Corporation could provide processes and strategies for private and public sector interplay that would benefit urban development deliberations and actions in the UK.

4.10 Cambourne Business Park

The main lesson emerging from the Cambourne Business Park, in respect of developing a community with higher levels of self-containment, is the importance of developing housing that will meet the needs of the community.

The initial handful of housing being developed adjacent to the Business Park was perceived to be poorly designed and constructed and not well suited to the initial Park employees. As the Park develops and new residential construction is undertaken there may be a better match, over time.

By matching the housing to the socio-economic requirements of the local workforce and their families, potentially higher levels of self-containment are likely within the region. Diversity in the housing will increase the potential to meet the needs of a wider cross-section of the community.

Immediate access to the trunk road to Cambridge provides good access to an excellent railway link to London and a direct link to a motorway 10 kilometres to the east providing rapid access to the nearby international airport at Stansted north of London, and other parts of the region.

4.11 The Merkur Bank, and Gaia Trust, Denmark

Large scale urban developments require a comprehensive range of financial structures from small scale start-up facilities to those meeting the needs of large, transnational corporations. Finance and banking infrastructure is an important element for industry development.

The *Merkur Bank* and the *Gaia Trust* provide very effective mechanisms for small-scale ethical investment based on sound lending and commercial practices. This approach, with some similarities to regional banking, is more suited to the smaller end market or those activities that are harder to finance.

The Merkur and Gaia approach indicate competitive advantage is derived through cultural strengths with commercial cooperation actively fostered through the formation of communities of companies and customers at local and national scales.

The *Merkur Bank* advised of the existence of the larger *Triodos Bank* based in the Netherlands (with other offices in the UK and Belgium), also with the mission to demonstrate that prudent and profitable banking can be undertaken from a base of fundamental social, environmental and cultural values. The 1998 annual accounts for the *Triodos Bank* provide an excellent overview in English of the benefits that have been realised by this form of banking. Further information is also available from the website at <http://www.triodos.com>

Merkur and *Tridos*, both with about 20 years experience, have become increasingly visible assets and benchmarks for other organisations which want to incorporate social and environmental values into their corporate policy. Both are member organisations of the Brussels-based *International Association of Investors in the Social Economy*. A brochure on the association's activities is also complemented by a website at <http://www.inaise.org>

The operation of the *Gaia Trust* the *Global Eco-village Network (GEN)* and *Gaia Tech* through collaboration between *Gaiacorp* and the *Merkur Bank* demonstrates that innovative financing of technology-based small to medium enterprises (SMEs) can originate from the innovative support derived from *Gaiacorp's* management of foreign exchange exposure for international institutional investors. Originating in Denmark this form of support has been instrumental in the establishment of the *Danish Association of Sustainable Communities* and subsequently GEN and the financial support they provide to technology-based SMEs in Denmark and globally.

4.12 Kalundborg, Denmark

Enterprise clustering to achieve industrial and employment diversification and growth while improving environmental outcomes is a highly desirable goal. At Kalundborg they have gone a step further and achieved industrial architecture, design and aesthetic outcomes that match the acclaimed advantages of their industrial symbiosis:

- Reuse of by-products. The by-product of one enterprise becomes an important raw material for another.
- Reduced consumption of resources, e.g. water, coal, oil, gypsum, fertiliser, etc.
- Reduced environmental impact in the form of reduced emissions of CO₂ and SO₂, less discharge of wastewater and less pollution of water courses, etc.
- Better utilisation of energy resources. Waste gases are used in the energy production process.

The town of Kalundborg has developed in notable harmony with its significant stock of heritage buildings dating back to the 10th century and within its very appealing rural landscape, presumably a forerunner to the industrial aesthetics achieved in the past 30 years.

Industrial symbiosis could be achieved for other forms of enterprise clustering, real and virtual and combinations of these, under conditions that include:

- Enterprises functioning together – through appropriate compositions of enterprises such that the outputs from one enterprise (even wastes) meet the demands of other enterprises for inputs (even raw materials).

- Enterprises co-locating together – to reduce the costs of long pipelines or other delivery channels, and associated energy losses. In the case of by-products that are not energy-intensive in their creation or delivery short distance are less important.
- Enterprises collaborating together – through relationships characterised by openness, communication and mutual trust. In the case of Kalundborg it is considered that its relatively small size and isolated situation has provided fertile conditions for industrial symbiosis due to decision makers working there all know each other.
- Enterprises diversifying together – through local government administration as a key business partner that is focussed on working with the business partner enterprises to create the business policy conditions and opportunities for continuous diversification of the local industrial structure. In the case of Kalundborg this led to town heating from by-product process heat over 30 years ago to the successful cooperation among the five business partners and the subsequent and accelerating rate of establishment of new spin-off businesses – some 19 in the past five years.
- Enterprises massing together – to achieve the critical mass to ensure the provision of railway and road links that increase access to highly qualified professionals choosing to live in either the capital city or nearby rural or regional towns and villages.

The industrial symbiosis in Kalundborg is the only one of its kind in the world today. Industrial symbiosis is practised elsewhere, but rarely between more than two enterprises. In Kalundborg, six partners constitute the symbiotic network, and the Danish experience has attracted global attention.

Like the Merkur Bank, the Kalundborg approach to business is characterised by commercial cooperation, collaborative communities, and culture advantage.

4.13 Sophia Antipolis, France

A key factor in the initial development of Sophia Antipolis was the strong vision provided by Pierre Laffitte, the then Deputy Director of the Ecole Nationale Supérieure des Mines de Paris. This factor reinforced the advice of Doug Henton on the critical importance of a civic entrepreneur or champion to a project's success. This involvement by Laffitte was crucial in fostering the significant Federal Government interest that was developed in the project.

The success of Sophia Antipolis is also a result of the combination of natural and man-made infrastructure including its location on the Cote d'Azur and the high lifestyle amenity offered through the application of strong governance to the built form, an extensive regional transport network of high quality roads, its proximity to an international airport and the surrounding population of Europe as a market for its goods and services. The development also demonstrates the importance of the application of technology within the basic infrastructure of the project, i.e., the high standards of telecommunications, health and education available to the residents and the workers in the enterprises.

These natural and man-made attributes attracted large, transnational corporations or enterprises which then provided the support for a myriad of smaller enterprises to establish in close proximity. This development continuum indicates the importance of attracting 'anchor tenants' to the success of a project such as St Andrews.

Marketing of the project plays a very important role in its ability to attract enterprises and employment generators. The regional transport networks support the regional workforce that commutes to Sophia Antipolis each day.

Sophia Antipolis demonstrated the importance of ‘across the board support’ from the all spheres of government, the business community and the local community. The development of a ‘continuity agreement’ for the on-going planning of the project was seen as an important component for the success of future developments within the project.

Sophia Antipolis is only now implementing the development of low cost incubator space to attract emerging enterprises. Incubators are seen as an important component of future growth in the project.

The direct Science and Technology employment at Sophia Antipolis is significantly multiplied throughout the rest France, as well as parts of Europe, through the commercial spin-offs it develops. This ‘national’ function is a reason that the French Government supports Sophia Antipolis as it does.

The measurement of success of Sophia Antipolis takes account of the on-site employment generated as well as the spin-offs located in other parts of the metropolitan area and the State.

4.14 Kansai Science City, Japan

Just as Kansai Science City (KSC) will in the medium to long term deliver science, technology and cultural products and services on a major scale to its neighbouring prefectures of Kyoto, Nara, and Osaka, so also could an equivalent capacity operate from the various urban communities of St Andrews to meet the needs of regions and communities throughout the Indian Ocean region.

Clearly, as in Kansai, a critical success factor will be the availability of world class transport and telecommunications infrastructure linking St Andrews to Perth, Australia and the world.

The prospects for so doing are based on leveraging off the successful resource development communities established throughout Western Australia in challenging and diverse environments similar to those prevailing in developing countries throughout Indian Ocean region. Such diversity of environments is not experienced by any other developing country.

The prospects could also be brought to reality through effective partnerships with KSC institutions, partly based on leveraging from the potential for Japan to increase markedly the effectiveness of the delivery of its development assistance programs to developing countries, regions and communities in the Indian Ocean region.

The prospects are further heightened by the effective relationships that exist between the Tokyu Corporation and the Japanese Government.

4.15 Tama Garden City, Japan

Tama Garden City is a demonstration of a corporation's commitment and perseverance to taking a development through to its conclusion. It shows how an initial master plan of physical, social and environmental aspects can be developed into a complex community, over time. It also demonstrates the importance of efficient and effective regional transport networks.

A clear lesson from Tama Garden City is the potential for the private sector to provide many pieces of essential and non-essential urban infrastructure within a large community development. The application of strong governance enables a development to sustain a quality outcome over time.

The development of Tama Garden City over more than four decades, within the framework of Japan's land readjustment procedures and in a location just 15 to 35 kilometres from central Tokyo shows particular corporate sophistication in land assembly, land development and on-going land management.

5.0 WHAT NOT TO DO

5.1 ICF – Kaiser, San Francisco, USA

The processes of ICF-Kaiser appear to be compatible with the requirements at St Andrews.

5.2 Collaborative Economics, San Francisco, USA

The processes of Collaborative Economics appear to be compatible with the requirements at St Andrews.

The advice of Doug Henton was not to focus too heavily on hi technology industry for employment generation as a lower technology option may provide a more sustainable outcome. For example, the increasing interest by many communities in attracting call centres may not prove the most appropriate strategy due to the employees being lowly paid and, as a result of the pressure of the job, characterised by a high turnover of staff.

5.3 Calthorpe Associates

The processes of Calthorpe Associates appear to be compatible with the requirements at St Andrews.

5.4 Cambridge Futures, Cambridge, UK

There was limited public input to the identification of options at the outset of the process with the result that there is probably fairly limited ownership of or commitment to the assessment process beyond key stakeholders. Even the latter could find the overall evaluation process to be too academic and thereby of limited utility.

However, the debate on urban development in the regions hit the national press during the visit by the St Andrews Study Tour delegation to the Cambridge sub-region in a way that augurs heightened public interest in the issues of urban development. Increasingly the focus is on achieving outcomes for significant growth in regional populations that characterises the best small city and urban village living in the UK has to offer rather than more suburban sprawl in the expectation that enterprises and employment, other than supporting retail and services, will follow. The latter has characterised most of the government-led new town development in the UK in the past 40 years resulting in unfavourable public opinion concerning the outcomes achieved.

Urban village clusters within well-connected towns of up to 30,000 residents that collectively deliver higher levels of aggregate regional self-containment within city scale-developments of 250,000 residents serviced by world-class rail and road links to London and international airports is being championed by Sir Peter Hall in his role as Chairman of the Town & Country Planning Association.

5.5 Mill Creek, Seattle, USA

Mill Creek is a dormitory community for the surrounding regions' employment activities. Most residents commute to the larger metropolitan areas such as Everett, Seattle or Bellevue.

The aim of the St Andrews project is to develop significant employment opportunities for the local and regional community. A number of initiatives can contribute to the success of this including:

- the development of appropriate regional transport infrastructure would foster the capacity for the regional workforce to commute to employment opportunities across the North West Corridor;
- the development of a diverse range of housing at St Andrews that would be conducive to attracting the cross section of socio-economic profiles required in a successful and sustainable community; and
- strong governance to ensure quality development and management throughout the project, over time.

5.6 North West Landing, Tacoma, USA

The capacity for Intel and State Farm, and future employers, to have access to a pool of appropriately skilled employees, and for the residents of North West Landing to commute to their places of employment are enhanced by the high level of access provided by the regional transport network.

The socio-economic profile of the initial residential development at North West Landing was aimed at the lower end of the market, and as such, did not match the requirements of the employees at Intel and State Farm Insurance. Over time, as more development occurs and more employment is generated this mismatch may be resolved. This initial outcome demonstrates that it is not always possible to predict the overall needs up-front in a large scale development.

If St Andrews is to cater for all socio-economic levels it should provide a diverse range of housing types and styles.

5.7 The Woodlands, USA

The Woodlands demonstrated there are a number of different approaches to successful development and that variation can enhance the overall outcomes, so long as a strong series of controls are in place to maintain the development's standards of urban design and quality assurance, over time.

Notwithstanding the claim that The Woodlands provided residential housing suitable for all employee levels at The Woodlands, i.e., from Chief Executives to janitors and part time hospitality industry staff, the lower cost accommodation was not readily seen - other than a very small amount of assisted accommodation.

If St Andrews is to cater for all socio-economic levels it should provide a diverse range of housing types and styles to suit the workforce and the growing community.

5.8 Peterborough, UK

With hindsight the UK Government is most unlikely to implement another central planning approach to the development of New Towns, even where there are acute population growth pressures. There is pressure to find and implement solutions to improved traffic movement. This rates very highly with a public that is favourably disposed to increased investment in regional public transport systems.

There is growing public pressure for solutions that avoid the worst outcomes of the post-war New Town program and the delivery of retail and service centres for suburban sprawls that alienate rather than build a sense of community. The best of integrative community development outcomes achieved by the Peterborough New Town Development Corporation is being by-passed by the current local government administration who are allowing the private sector to deliver retail shopping solutions that make little or no contribution to building a sense of community.

In other words, the worst rather than the best of new town development outcomes could become the norm for the continued development of these towns as well as being a dominant driver of urban development throughout much of the UK.

5.9 Cambridge New Town Corporation

CNTC are seeking to build a New Town within 20 kilometres of Cambridge that would reduce the adverse environmental growth pressures on the sub-region while maintaining or enhancing the sub-region's very impressive economic performance.

While well aware of the strengths and weaknesses of the new town program, CNTC is seeking to overcome these weaknesses by drawing on the track records and networks of a highly successful internet entrepreneur (Peter Dawe) and the notable contributions of a chief executive (Wyndham Thomas) of one of the more successful New Towns.

Given Dawe's commercial background in internet based telecommunications there are good prospects of, amongst other things, implementing the virtual highway option of Cambridge Futures as a means of reducing traffic congestion that could be created by a New Town. With this option there would also be significant demand for regional public transport networks to ensure this problem does not arise.

They are also well positioned to ensure that the *Cambridge Futures* project is not overly academic and that the views of prominent academic or non-practising commentators on the directions for new urban development are tempered by leading-edge public and private sector thinking and planning.

5.10 Cambourne Business Park

The initial housing being developed adjacent to the Business Park was perceived to be poorly designed and constructed and not well suited to the likely Business Park employees. There did not appear to be any strategy to match the housing to the workforce, albeit, this view was based on a very small sample.

The application of strong levels of governance would assist in improving the quality of development and sustain it over time.

The importance of an efficient regional transport network was reinforced as the most effective means of linking the community to employment opportunities.

5.11 The Merkur Bank and Gaia Trust, Denmark

There is a paucity of mechanisms in Australia for the type of financing of technology-based SMEs provided by member organisations of the *International Association of Investors in the Social Economy* (IAISE) such as the Merkur Bank and the Triodos Bank.

The attraction of knowledge-based and high-tech SMEs is a priority of urban development projects throughout Australia. However, few have a portfolio of financing mechanisms that includes the types of financing characterised by member organisations of the IAISE *International Association of Investors in the Social Economy*.

Large scale urban developments require a range of finance and banking infrastructure. An indication of the scales required relative to their markets is outlined in the following matrix.

	Sole Trader/Very Small Scale	Small Business	Medium Corporations	Major Corporations
Regional Banks / Credit Unions				
State Banks				
National Banks				
International Banks/Finance Houses				

5.12 Kalundborg, Denmark

Establishing urban communities of larger than 20,000 residents are less likely to provide the conditions to achieve Kalundborg-type outcomes. This augurs well for the distinct urban communities of about 15,000 residents foreshadowed throughout the St Andrews development area.

Less than business partner relationship by local government will not generate the outcomes realised at Kalundborg.

Anything less than Kalundborg outcomes by new urban communities means that they will be benchmarking below best practice in community development and missing out on the global export opportunities that will directly flow from delivering such outcomes. Not just from the direct and synergistic outputs of the business partnerships created community by community, but also from exporting the technical solutions, put to use in growing world markets for environmental products, technologies and services. Many of these markets are massive and virtually on our doorstep. As such they would provide a tremendous opportunity for many parts of Australia including the clustering of enterprises that will operate from St Andrews.

Providing good access links for highly skilled professionals wishing to work within the region will improve the prospects of achieving the types of outcomes realised at Kalundborg.

The high levels of urban and industrial amenity demonstrated at Kalundborg can be achieved by the application of appropriate design and management covenants and controls.

5.13 Sophia Antipolis, France

The attraction of enterprise to Sophia Antipolis has always been through a ‘top down’ process with access to significant Federal Government resources. The development of government funded infrastructure provided the base for employment generation.

Employment generation at St Andrews is more likely to be driven from a ‘bottom up’ approach as per The Woodlands and Peterborough. On this basis, it will be important not to just look to high technology options, but to other lower technology options as advised by

Doug Henton of Collaborative Economics. The provision of low-cost incubator space at the front-end of the development, rather than after 20 years, may help to attract emerging and start-up enterprises to St Andrews.

Sophia Antipolis had high levels of local employment relative to the population base, however, the numbers of residents who worked locally were relatively low. This journey to work movement demonstrated a considerable need for efficient and effective regional transport infrastructure. The excellent road systems within the region met this need.

5.14 Kansai Science City, Japan

Failure by the three spheres of governments in Australia to assess the prospects for globally-significant and creative collaborations between the science city programs of Kansai and St Andrews will bypass the opportunity to achieve significant mutually beneficial outcomes for developing countries and communities, Japan, Australia and indeed the global environment and economic system.

Failure by the Australian Government to capitalise on this prospect as it begins to be shaped by the collaboration between the Western Australian Government and the Tokyu Corporation will ensure a bypass outcome.

Failure to deliver effective regional public transport networks between St Andrews and Perth and throughout the North West Corridor will lessen the prospects for the creation of a globally significant development at St Andrews.

Failure by local government to establish and work in a business partner relationship with the principal proponents of the St Andrews Project will ensure that the approach roads to the bypass are ready before the bypass.

5.15 Tama Garden City, Japan

The scale of development at Tama Garden City, and the systems within which it was developed, are very dissimilar to the Australian and Western Australian context in general and the St Andrews context in particular.

This model for holistic urban development does not easily translate to Western Australia and, as such, is not capable of being used as a benchmark for the St Andrews development.

6.0 AGGREGATE ASSESSMENTS

6.1 Overview Comparisons Of Profiles With Possible Categories Of Enterprises For St Andrews

The columns numbered 1-12 in the following matrix represent the twelve clusters or categories of enterprises identified as a result of the May 1999 IDEA Project Steering Committee Workshop. The rows numbered 1-16 represent the fifteen destinations, development sites or ventures described in the foregoing as well as Montpellier, France which was profiled but not visited.

The IDEA Project World Study Tour Report

The degree to which activities of the 12 categories characterise the industrial activity within the sixteen sites, as described in the profiles, is shown in the matrix according to the following rating scheme:

High	
Medium	
Low	

Profile	Possible Categories of Enterprises											
	1	2	3	4	5	6	7	8	9	10	11	12
1. ICF – Kaiser (1)												
2. Collab. Economics (2)												
3. Calthorpe Assoc. (3)												
4. Cambridge Futures (4)												
5. Mill Creek												
6. North West Landing												
7. The Woodlands												
8. Cambridge NewTown												
9. Cambourne												
10. Peterborough												
11. Merkur-Gaia Trust												
12. Kalundborg												
13. Montpellier												
14. Sophia Antipolis												
15. Kansai Science City												
16. Tama Garden City												

Key: Possible Categories of Enterprises for St Andrews

- | | |
|-----------------------------------|---|
| 1. Educational Campus-Communities | 7. Infrastructure Leveraging |
| 2. Research | 8. Lifestyle - Recreation/Arts/Culture |
| 3. Tourism Leveraging | 9. Inherent Employment |
| 4. Lead Professional Services | 10. Advanced Manufacturing |
| 5. Core Self Containment | 11. Value Adding to Natural Resources |
| 6. Export Leveraging - SURD/3R's | 12. Biotechnology/health/medicine/pharmaceuticals |

Notes: Focus for assessment of each enterprise cluster by venture.

- (1). Social and economic business planning, strong links to engineering.
- (2). Strategic and innovative social and economic advice.
- (3). Urban Design.
- (4). Community consultation.

Clusters of enterprises could occur within any of these twelve categories at one or more locations throughout the proposed new city development at St Andrews. Clusters could also comprise groupings of enterprises from two or more categories at one or more locations. In some case these clusters will result from a common interest such as achieving administrative efficiencies (e.g. *Cambourne Business Park*) or minimising the use of natural resources (e.g. *Kalundborg*). In still others clustering could be achieved through online communications and e-commerce solutions among enterprises located anywhere throughout the new city or for that matter anywhere in the world (e.g. *Global Eco-village Network* supported by *Mekur Co-operative Bank* and *Gaia Trust*).

7.0 ALLIANCE PROSPECTS

7.1 ICF – Kaiser, San Francisco, USA

The benefits of forming a strategic alliance with ICF – Kaiser would be access to their business planning methodology, particularly in Value-Chain Analysis and Gap Analysis.

Over time, this organisation has developed a very large client base with case histories of relevance to the proposed development at St Andrews.

The alliance would strengthen the IDEA Project's capacity to identify appropriate activity clusters with the added potential of access to ICF clients who may wish to participate in the development of St Andrews.

7.2 Collaborative Economics, San Francisco, USA

There are gains to be made for St Andrews by forming a strong strategic alliance with Collaborative Economics with respect to the application of their knowledge of the role of leaders or champions in the successful building of communities.

Their involvement, via teleconference and email, in the forthcoming IDEA Project workshop would add significantly to the expertise available in a number of areas including the development of Public Policy, Industry Analysis and Community Concerns.

7.3 Calthorpe Associates

Major benefits flowing from an alliance with Calthorpe Associates would include tapping into their expertise on self-sustaining local economic strategies and access to world class urban design concepts and their application.

The urban design input would flow across the entire project including all activity clusters to provide continuity for the St Andrews development.

7.4 Cambridge Futures, Cambridge, UK

The main benefits from an alliance with *Cambridge Futures* project would be to gain access to the high quality online and offline publications on the public comments harnessed on the options for urban development in the Cambridge sub-region.

Maintaining a watching brief on the results of more detailed planning associated with the seven options and combinations of these options would be worthwhile. Of particular interest would be the results of more detailed planning of public transport stimulated by the highest rated option concerning improved regional public transport links. Given its high rating it is likely that more detailed planning will become available in the short term.

However, the high electronic accessibility of these publications reduces the need to establish a formal alliance.

The computer modelling of the economic and environmental impacts of land use and transportation configurations underpinning the options for urbanisation is no more advanced than similar modelling work widely applied in Australia.

7.5 Mill Creek, Seattle, USA

The IDEA Project has an alliance with Mill Creek by virtue of the involvement of Tokyu in both projects.

7.6 North West Landing, Tacoma, USA

Potential exists for St Andrews to form an alliance with enterprises within various industry clusters at North West Landing, including advanced manufacturing and professional services. Access to enterprises within these clusters would provide valuable case study materials.

An alliance with the local government body could assist in the investigation of the fast approval process that was instrumental in attracting the advanced manufacturing activities.

7.7 The Woodlands, USA

An alliance with The Woodlands could focus on the activities undertaken to attract medical R&D to their project.

The difficulties in attracting universities, the approach of targeting individual researchers and the provision of incubator space could form the basis of a detailed case study for St Andrews.

7.8 Peterborough, UK

It is likely that further assessment of the progress of urbanisation since the completion of the new town development phase would assist in instructing the St Andrews Project on what not to do.

The main purpose of further consultation would be to continue the dialogue with Wyndham Thomas in his capacity as one of the leading players and commentators on the current debate concerning urbanisation arcing to the north and east of London. This could focus on keeping abreast of the UK debate on urbanisation and improved regional public transport networks.

7.9 Cambridge New Town Corporation

Cambridge New Town Corporation (CNTC) is seeking to win approval for a proposal to build a New Town about the same size as that proposed for St Andrews but less than half the distance from the centre of Cambridge as St Andrews is from Perth. (Coincidentally the distances between St Andrews and Perth in Western Australia and Scotland are about the same).

CNTC has been proposed to manage the growth of employment in the Cambridge sub-region. St Andrews will only be viable if it manages to attract enterprises and significant private sector investment.

The emerging implementation of the agreement between the Western Australian Government and the Tokyu Corporation could provide insights on processes and strategies for private and public sector interplay that would benefit urban development deliberations and actions in the UK in general and in relation to the Cambridge New Town proposal.

The plans and strategies for the types of enterprises that would be attracted to function within urban developments proposed for the Cambridge sub-region could provide useful inputs to the St Andrews IDEA Project.

The current Internet TV and communication initiatives being taken by Peter Dawe could assist in facilitating a dialogue between CNTC and the St Andrews project. This in turn could be channelled into web-based communications used to attract enterprises to and private sector investment in the St Andrews project. Dawe himself is a potential major investor in electronic commerce initiatives and enterprises based at St Andrews.

Of particular interest to the St Andrews Project will be the assessments and plans for providing improved regional public transport links between the proposed New Town and Cambridge and London.

7.10 *Cambourne Business Park*

An alliance could be developed between St Andrews and Development Securities PLC, the developer of the Cambourne Business Park. Development Securities PLC is a major London-based property developer, however, senior staff in the organisation have worked in the Australian property market, in particular with the assessment of large retail shopping malls.

Potential exists for Development Securities PLC to be an investor at St Andrews in commercial and retail developments.

The New Town assessments and plans for providing regional public transport links between the new town and Cambridge and London could be of value to the St Andrews Project.

7.11 *The Merkur Bank and Gaia Trust, Denmark*

Membership of the International Association of Investors in the Social Economy (INAISE) is open to financial institutions only. Non-European financial institutions may apply for associate membership, as travelling distances may prohibit them from participating in INAISE activities, which will mostly be organised in European countries. Admission of members is subject to the approval of the Board of Directors. The Prometheus Foundation of New Zealand is a member organisation. A brief on their activities is available from the website of *Technology New Zealand* at: Email: prometheus@clear.net.nz
<http://www.technz.co.nz/organisations/funding/prom.htm>

The question of whether the St Andrews project will seek to foster the establishment of such a financial institution as part of its portfolio of financing mechanisms and approaches is open to the deliberations of the IDEA Project.

Membership of the Global Ecovillage Network (GEN) is open to ecovillages and related projects, as well as individuals and organisations with an interest in what is happening. The GEN International Secretariat based in Denmark coordinates communication flow, builds partnerships and launches new projects largely through three regional secretariats:

- The Ecovillage Network of the Americas divided into eight biocultural regions.
- GEN Europe also covers Africa and the Middle East and includes many national networks.
- GEN Oceania/Asia embraces Asia, Australia and the Pacific Islands, with a South Asia sub-region based in Sri Lanka.

GEN's activities also include:

- Maintenance of a very active website for information, contacts and resources at <http://www.gaia.org>
- Newsletters for each region.
- Videos on ecovillages and GEN.
- Training, course and consultancy on many topics including permaculture, ecovillage design, natural health, personal development, etc.
- Membership in the United Nations Best Practice Steering Committee for improving the living environment.

In 1998 out of thousands of projects, three GEN ecovillages were included in the United Nations' top 100 Best Practice for improving the living environment:

- Crystal Waters, Australia.
- The Findhorn Foundation, Scotland.
- Lebensgarten, Germany.

The question of whether the St Andrews project will seek to join GEN is also open to the deliberations of the IDEA Project.

Active use of website technologies by the St Andrews project could facilitate a global dialogue on the INAISE and GEN approaches to attracting investment in technology-based enterprises. This dialogue could be extended to include an online investment attraction dialogue with the Cambridge New Town Corporation, conceivably by linking with the Internet TV and communication initiatives of Peter Dawe, the foundation chairman of CNTC.

7.12 Kalundborg, Denmark

A good deal has been written about Kalundborg that could benefit the deliberations of the IDEA Project. Of particular interest are the experiences of the past 5 to 10 years in attracting 'spin-off' enterprises in general of the kind that are likely to be sought by development at St Andrews.

The Kalundborg Symbiosis Institute has undertaken to send detailed overheads on enterprises attracted in recent years. This should provide a useful start on the content analysis of detailed documentation that could be sought from the enterprises concerned.

Of particular interest to the St Andrews project would be an analysis of the numbers of professionals that have commuted to Kalundborg from within the region in the past 15 years as the industrial symbiotic outcomes have become increasingly sophisticated and effective.

It could also be of value to assess the interests of other visitors to the Symbiosis Institute. This includes a number of visits by Japanese and American enterprises. Providing the documentation on the Symbiosis Institute in St Andrews Study Tour report should lead to the provision of documentation provided by other visitors or prepared by the Institute itself.

7.13 Sophia Antipolis, France

Significant potential exists to create a number of strategic alliances with the management of Sofia Antipolis as well as with a number of the enterprises located in the various activity clusters on site.

An alliance with SAEM Sophia Antipolis, the management organisation, has potential to assist St Andrews by way of:

- Development
 - Experience in industry analysis, development of poles of excellence;
 - Infrastructure requirements, incubators, synergies within and between clusters;
- Marketing
 - National and international marketing, logistics of capturing footloose enterprises;
- Communications
 - Experience in promoting activities within the science park to its occupants and residents including the development of 'The Club of Directors' and the 'Sophia Antipolis Foundation', experience in promoting its activities to the world;
- Linkages to other science parks around the world, including the Kansai Science City.

Potential also exists for St Andrews to form an alliance with enterprises within various industry clusters at Sophia Antipolis, including advanced manufacturing, biotechnology, education and further training, telecommunications, and environmental sciences. Access to enterprises within these clusters would provide valuable case study materials.

7.14 Kansai Science City, Japan

The opportunities for collaboration with existing and emerging enterprises in the Kansai region of Japan are myriad. With a population of over 21 million, Kansai's gross regional product of approximately \$US500 billion would rank seventh in the world if compared with that of all other countries. If separated out from the rest of Japan, Kansai would be Australia's fifth largest export market. With the new Kansai International Airport, Kansai is expected to remain at the forefront of Japanese expansion.

The following quote concerning opportunities for business partnering is relevant¹:

Given the sheer size of the Kansai economy, does it actually matter if it is growing as an economy or not? How many Australian companies at full capacity could ever hope to supply this powerhouse? Probably none, so it is not a question of growth but access.

By access I don't mean trade barriers, I mean mental barriers. There are two sets of mental barriers that have to be overcome. One is the mindset in elements of the Australian business community, who believe what they read in the media about Japan is actually relevant. They are incorrectly concluding that things are so bad in Japan that they should not bother with that market for the time being.

It is so ironic for me that while the mental barriers in Japan against Australian products and services are breaking down, the Australian side is in full retreat.

Partnering with key players in the Kansai Science City endeavours could provide the basis for establishing and nourishing business partnerships involving enterprises based in the St Andrews and Kansai regions.

Principally, the *Kyoto Research Park* facility could provide an address and base for technology-based enterprises operating from St Andrews and establishing business-partnering initiatives with enterprises, particularly SMEs, operating in the Kansai region. This experience could be used to establish an equivalent facility to *Kyoto Research Park* in St Andrews focussed on delivering similar outcomes. State-of-the-art tele-communications between these facilities could be supported by world leading technologies being developed at the Perth-based *Cooperative Research Centre for Telecommunications* and the *Advanced Telecommunications Research (ATR) Institute International*, the first research institute in Kansai Science City.

Other possible collaborative initiatives suggested by the lightning visit of the Study Tour delegation to the following institutes in the Kansai Science City include:

- *Nara Institute of Science and Technology* – NAIST is a prestigious postgraduate research university with schools for Information Science, Biological Sciences, and Materials Science and an active program of international exchange for researchers. St Andrews could seek to boost markedly the percentage of leading researchers participating in the exchange program to and from Australia, particularly as this relates to advancing the prospects of technology-based enterprises operating in the St Andrews and Kansai regions.
- *Kansai Research Institute* – KRI has more than 10 years experience in proposing the establishment of cultural and scientific facilities and planning and forming consensus regarding construction of these and Kansai Science City as a whole. As such it is well placed to advise St Andrews on the identification and establishment of research institutes, particularly those that are appropriate to advancing the prospects of technology-based enterprises operating in the St Andrews and Kansai regions.
- *Research Institute of Innovation Technology for the Earth* – RITE conducts R&D in cooperation with researchers all over the world. “The goal is to deliver technological breakthroughs that will realise the co-existence of sustainable development and global environmental preservation.” Collaboration with relevant initiatives at St Andrews could be supported by the International Research and Cooperation Program of RITE,

¹ “Sun rises again in Japan”, by Greg Story, Australia’s Consul General and Senior Trade Commissioner in Osaka, *Business Asia*, August 2, 1999.

particularly through grants for international cooperative research that invite public contributions to research proposal from all over the world.

- *Comprehensive Housing R&D Institute - High-Touch Research Park* – supports a major program of research to discover and create ideal housing at Sekisui House. In identifying opportunities for collaboration in this sector the following further quote from the article by Australia’s Consul General and Senior Trade Commissioner in Osaka, Greg Story, is relevant:

“Enter Australia, with so many products that are different to what has been seen in Japan before. Furniture for example, uses timbers, which are native down under. But these same colours are unique in Japan. This is a market where the Italians are fighting it out with the American and the Scandinavians. What about us? We are using quite different fabric designs from what has been seen in Japan before. And we have sold more into the Japan market in the past few years than in the past 30 years.

There is also the whole question of Australian building materials and imported housing. Australian bricks and pavers have seized a 90 percent-plus market share for the imported product. This is because of the greater variety of colours and the quality of the product, offered at a highly competitive price.

Australian imported housing is blazing a new trail in Japan, offering unique brick exteriors, and design ideas which are totally different from the dominant Canadian and American models.

Australian cyprus pine is naturally termite resistant, and here is a product for the times. Japanese mothers are not interested in buying products that give off residues around their children and are carefully examining what is going into their family home. Therefore treated timber, commonly used in the foundations, are definitely on the endangered list.”

- *Kyoto Prefectural Comprehensive Center for Small & Medium Enterprise* – operating from the Kyoto Research Park this center provides SMEs in the Kyoto Prefecture with guidance, survey data, and research and information services relating to management and technology. The following quote is relevant to the prospects for cooperation among SMEs based in the St Andrews and Kansai regions²:

“The emergence of New Japan can be seen across the economy. According to Richard Werner, chief economist for the Tokyo-based Profit Research Centre, the long recession has convinced even the most ardent traditionalists that Japan needs to change. Japan is on the threshold of a "New Economy", based around the expansion of telecommunications and the internet. Even the Economic Planning Agency supports the proposition, describing its latest template for Japan as one that encourages a shift towards a "risk-taking, knowledge-based society". Technology investment is very strong in industry against a backdrop of overall declines in capital expenditure. In the September quarter, spending on broadcasting and telecommunications grew 15 per cent year on year compared with a 0.4 per cent decline - the ninth in a row - in general industry. A growing body of evidence suggests that despite the attempts by the Liberal Democratic Party to prop up Old Japan and keep its support bases happy, New Japan is rapidly taking over.

In 1999, there were 102 initial public offerings in Japan, up from 85 the year before, and they were dominated by new-tech firms. ING Barings strategist Jonathan Allum says next year there could be up to 250 IPOs and among those already flagged he identifies a preponderance of internet stocks and Anglo-Saxon names. The average age of the company presidents is 36.8 years and many have staff members under 30. Very New Japan, he says.the broad Topix market index shows that over the past 12 months, New Japan stocks have posted increases of 177 per cent while Old Japan has declined 12 per cent.

Beyond the apparent success of small companies in Japan, an important influence has also been the age of a company, he says. The restructuring story is also taking hold outside the public market. Small business Japan, nearly 90 per cent of enterprises, is moving alongside the headline restructurers. Much of this restructuring is highly micro, with large cost savings being achieved by reductions in input prices on the part of subcontracting firms. Since much restructuring has occurred at this level, it is beyond the headlines. But there is no way to avoid restructuring and if it succeeds Japan will be an infinitely richer, more comfortable and more competitive country.”

² “Why New Japan must overthrow the old” by Andrew Cornell, *Australian Financial Review*, 8 January 2000,

Further assessments of plans for improvements in the regional public transport networks within Kasai Science City and linking the city to Osaka, Kyoto and Nara could be of value to the St Andrews Project.

7.15 Tama Garden City, Japan

The IDEA Project has an alliance with Tama Garden City by virtue of the involvement of Tokyu in both projects.

ANNEX A – PROFILES

THE WOODLANDS PROFILE

Project Name: The Woodlands, Texas, USA

Descriptive title: The Woodlands, Texas is a forested, 25,000 acre (10,100 ha), master planned community consisting of residential villages, commercial developments, schools, churches and extensive recreational amenities. Planning for The Woodlands commenced in 1970 with the first land sales in 1974.

Abstract

The Woodlands is an internationally acclaimed urban development in a forest zone near Houston. It is located 27 miles (43 km) north of downtown Houston on I-45, near the terminus of the Hardy Toll Road.

When completed in the next century, The Woodlands will be home for an estimated 150,000 people in 52,000 residences. Plans call for 82,000 jobs, 3,100 employers and retention of approximately 25 percent of the community's 25,000 acres in forest preserves, parks, golf courses, lakes and open spaces.

The employment hub is The Woodlands Business complex which forms a 5,000 acre (2,000 ha) crescent alongside and across Interstate 45. It is composed of four zones of development: Town Center, Research Forest, Trade Center and College Park.

The Woodlands currently has a residential population of approximately 56,000 and a town centre with almost 1.5 million square feet (140,000 m²) of office space, restaurants, theatre and other amenities. The site has connections with expressways, Houston Intercontinental Airport and the main line of Union Pacific Railroad.

Key Stakeholders

Proponents

The Woodlands venture was initially developed by The Woodlands Corporation, then a wholly owned subsidiary of Mitchell Energy & Development Corporation. This company was sold by Mitchell Energy in July, 1997 as part of a restructuring that focused on core activities. The Woodlands development company, now called The Woodlands Operating Company was purchased by a partnership of Crescent Real Estate Equities Company of Fort Worth and Morgan Stanley Real Estate Fund II Ltd of New York.

See <http://www.thewoodlandsusa.com/>

Ian McHarg of Philadelphia, author of "Design with Nature" and considered by many to be the father of the US environmental movement, was in charge of environmental planning. William L. Pereira of Los Angeles, whose achievements include planning new towns in the United States and abroad, concentrated on planning and design. Other widely recognized leaders were retained for economics and marketing, engineering and liaison with government agencies.

Scale of Investment

Investment of \$3.4 billion had been undertaken to 1995. Projected investment is \$4.5 billion by the year 2,000 and ultimately \$12 billion. Other key statistics for The Woodlands include:

	As of 1995	Estimate for 2000	Ultimately
Employers (as of 1/1/95)	660	725	3,100
Number of Jobs* (as of 9/30/95)	15,775	20,000	82,000
Total Dwellings	16,943	23,500	52,000
Total s.f. Commercial Space	9.6 Mil.	12.4 Mil.	41.0 Mil.
Miles of Hike and Bike Trails	71	100	140
Population (as of 9/30/95)	44,061	60,000	150,000
Number of Churches	26		60
Miles of Roadways	200	265	1,000
Number of Schools	13		26

Commercial and Educational Activities

The ***Research Forest*** currently contains over 32 entities employing more than 2,000 people, including more than 300 PhD's. It includes the Houston Advanced Research Center with more than 200 people employed and 40 separate research projects and a number of large corporations. The Research Forest also has a 100 acre (40 ha) campus with affiliates at nine major U.S. universities and research institutions.

Several medical institutions are also located in The Research Forest, including Baylor College of Medicine. The Anderson Cancer Research Center conducts research programs in cancer biology, medicinal chemistry and macrophage biology.

Among companies in The Research Forest are Pennzoil, Western Company Resource Technologies, Inc., The Western Company of North America, Wil Tel, Betz Laboratories and Houston Biotechnology Incorporated.

The Woodlands' Research Forest was selected by Hughes Christensen (formerly Hughes Tool Company) for its new 230,000-square foot (21,400 m²) complex world headquarters office, a research laboratory and drill bit assembly plant. The new complex occupies a 24.75 acre (10 ha) site. Hughes recently relocated another facility from Salt Lake City to The Woodlands.

The ***Trade Centre*** occupies 900 acres (365 ha) and is used for light manufacturing and distribution, and by several major companies involved in pharmaceuticals and food distribution. Companies in the Trade Center include Eckerd Drugs, Tenneco Business Services, Raychem Corporation and Burger King Distribution Services.

The Trade Center is served by more than 30 common carrier truck lines operating in the Houston commercial trucking zone. Via I-45 and the 22 mile (35 km) Hardy Toll Road (built by The Woodlands Corporation as part of a \$1.2 billion transport up-grade commencing in 1987), there is convenient access to the Port of Houston, Houston Intercontinental Airport and other sections of the metro area.

College Park is an area that includes Montgomery College which operates from a 250,000 square-foot (23,225 m²), state-of-the-art permanent campus on a 100 acre (40 ha) site, located near the intersection of I-45 and State Highway. This college accommodates some 4,000 students and offers undergraduate degree courses of study in collaboration with several area universities.

The developed areas of The Woodlands community are served by the *Conroe Independent School District*. This School District serves 30,000 students on 40 campuses, employing 4,000 people. Public schools are located within village neighbourhoods and offer grades Kindergarten - 12. For alternative private education, The Woodlands community includes a college-preparatory private school, The John Cooper School, for grades Kindergarten -12 and The Woodlands Christian Academy for grades Pre-K-9. There are also a number of pre-schools and day care centers within The Woodlands.

The *Town Centre*, or downtown of The Woodlands, contains almost 1.5 million square feet (140,000 m²) of office space housing over 400 businesses, master planned in 800 acres (325 ha). It also contains The Woodlands Mall, a bi-level 785-seat waterfront Landry's Seafood House, Grady's American Grill and Romano's Macaroni Grill and a 17-screen Cinemark movie theatre - Tinseltown at The Woodlands. Anchor tenants in the Mall, which opened in 1994 include Dillard's, Foley's, Sears and Mervyn's. Another 140 plus other stores are also located in the Mall.

Other commercial centres in The Woodlands include Pinecroft Center, Wood Ridge Shopping Center, Panther Creek Shopping Center and Cochran's Crossing Shopping Center.

Residential and Community Activities

Residents of The Woodlands live in five villages - Grogan's Mill, Panther Creek, Cochran's Crossing, Indian Springs and Alden Bridge. Ultimately, there will be seven villages, each containing a variety of homes, schools, churches, recreational facilities, shopping and community services.

The Woodlands offers a full range of housing opportunities, from affordable new homes and units to luxurious estates with golf course or lakefront views. Public housing is also catered for, including special living opportunities for senior citizens where rent is based on income.

The Woodlands Healthcare Center, a luxurious 181-bed retirement living and nursing centre, opened in 1986. The Forum at The Woodlands is a retirement living neighbourhood with 303 rental apartments and cottages.

Recreational and entertainment infrastructure includes:

- The Woodlands Country Club, a membership facility, including 45 holes of golf, the most recent extension was designed by Arnold Palmer.
- The Woodlands Country Club has complete health spa facilities and 24 indoor and outdoor tennis courts.
- The PGA Tournament Players Course TM is a public, 18-hole facility.
- The Woodlands Athletic Center is a private swim, tennis and athletic center for members with Olympic-class swimming and diving facilities.
- A regional YMCA is located in the Village of Cochran's Crossing.
- Numerous neighbourhood parks throughout the community including swimming pools, playgrounds, playfields, picnic pavilions, tennis courts, and lakes and ponds for fishing – all connected to residential neighbourhoods via a network of more than 71 miles (114 km) of wooded hike and bike trails.
- Lake Woodlands, a 200 acre (80 ha) stocked lake in the Village of Panther Creek, provides sailing and fishing recreation for the community.
- The Woodlands Recreation Center includes a fitness room, game room, music, meeting rooms and gymnasium.
- The 13,000-seat Cynthia Woods Mitchell Pavilion, the summer home of The Houston Symphony, represents a total investment of \$14 million.

Statement of Achievements

1. Achievements delivered by the project or activity in relation to the IDEA Project concept areas of:

Innovation – type, extent, success, method, etc.

- The Woodlands 5,000 acre (2,023 ha) business complex represents one of the most ambitious, and successful, commercial and industrial real estate developments ever undertaken by a single company.
- The Woodlands has been a winner of several ULI Awards for Excellence in the special development category given annually by the Urban Land Institute to recognise development projects that exemplify superior design, relevance to contemporary issues and needs, and resourceful use of land while improving the quality of the environment.

Development - in a sustainable manner

- Since the inception of planning, careful attention has been paid to the ecology of The Woodlands, with emphasis on preserving natural vegetation. Careful planning has resulted in the greenbelts around each neighbourhood. The plan has allowed for quiet cul-de-sacs, small neighbourhood parks, and shared parking lots to minimise paved area and preserve trees.
- The Woodlands Covenants and Residential Development Standards have been designed to put into place procedures that will carry forward The Woodlands Development Philosophy and commitment to protecting the environment and enhancing the quality of life in each residential neighbourhood.
- In 1995, for the sixth consecutive year, more new homes were sold in The Woodlands than in any other Houston-area real estate development. This rate of sale continues today.

Employment - knowledge based employment outcomes, growth projections

- The Woodlands, Texas, is home to more than 750 businesses employing over 18,500 people in a range of hi-tech, medical, bio-tech, business and financial services, light manufacturing and distribution. By early the next century, the number of business enterprises should reach 3,100 and total employment in the order of 82,000 jobs.
- The Town Center is being developed in accordance with a comprehensive master plan. Within the next 20 to 30 years, it is planned to be a downtown for a region of more than one million people, with 16 to 18 million square feet of commercial development. An estimated 40,000 people will be employed here.

Application – including the degree to which spin-offs occurred and the extent of any emulation of the project or activity by others

- Many of the Planned Urban Developments and master planned developments, particularly those in the south east and south west of the United States have modelled components of their development on The Woodlands. Examples include Las Colinas, a 12,000 acre (4,850 ha) development located within the City of Irving, between Dallas and Fort Worth, McCormick Ranch, a 4,200 acre (1,700 ha) development in Phoenix, Arizona and Weston, a 10,000 acre (4,000 ha) development adjacent to Fort Lauderdale, Florida.

2. Achievements related to the attraction of enterprises and clusters of enterprises, and investment attraction:

- In 1972 Mitchell Energy received a \$50 million loan guarantee from the U.S. Department of Housing and Urban Development for development of its new, planned community, The Woodlands. Ultimately, The Woodlands was the only commercially successful HUD new town, retiring the \$50 million in debentures in 1992.
- Companies that have located in The Woodlands report high productivity and retention rates because their employees can be housed in a sophisticated business environment while working just a few minutes from home and family. Improved "quality of life" has been found to be an important motivator.
- Companies relocating to The Woodlands find it easy to relocate existing employees, as well as attract and keep professional talent, which results in lower recruiting costs and more productive business operations.
- Financial incentives may be available for some relocating companies including property tax abatements and discounts associated with electrical power usage. Non-financial incentives include access to a well-trained and growing labour force of approximately a half-million people living within a 20-mile commuting radius. In addition, the state provides training programs to help maintain a competitive labour force. Texas is a right-to-work state, which is attractive to many employers.

Alliances Achieved

A number of formal and informal alliances and affiliations have developed in and with The Woodlands, including:

- The formal educational affiliates of the Houston Advanced Research Center (HARC) are the University of Texas at Austin, Texas A&M University, Rice University, the University of Houston, Baylor College of Medicine, Lamar University, Louisiana State University, Sam Houston State University and Tissot Economic Development Foundation.
- WCSC: The Woodlands Community Service Corporation is the management and maintenance company which provides services to the community associations listed below. WCSC is responsible for the day-to-day operations of each association and for ensuring that the goals and projects of each association are implemented in an efficient and consistent manner, thus assuring the quality of life enjoyed by residents in The Woodlands.
- TWA: The Woodlands Association, Inc., and WCA: The Woodlands Community Association, Inc. are homeowners' association for residents and property owners in The Woodlands. The associations provide urban services including trash collection, recycling, community recreation, parks, pathways and fire and police protection. They also provide a number of community volunteer opportunities through The Woodlands Watch and The Woodlands Fire Department, and opportunities to participate in local government by running for positions on the Boards of Directors or Village Associations, or on the Residential Design Review Committees.
- WCOA: The Woodlands Commercial Owners Association, Inc. is an association which serves commercial owners in the Town Center, College Park and Research Forest areas of The Woodlands, providing many of the same services as TWA and the WCA.
- Potential alliances with the IDEA Project for follow-up during the Study Tour could include the educational affiliates of the HARC and the WCOA.

CAMBRIDGE PROFILE

Project Name: Cambridge Futures, Cambridge New Town, Cambourne and Cambourne Business Park

Descriptive Title: Assessments of short and medium term urban development proposals to support Cambridge as a high-tech powerhouse

Abstract

The 'Cambridge phenomenon' has come to parallel Silicon Valley: it has become a worldwide image or symbol of the innovative milieu. Cambridge as a high-tech centre is essentially a creation of the 1970's and 1980's and represents genuine entrepreneurial, new-firm-based growth, based on computing, scientific and electronic equipment, and increasingly biotechnology – which had spun off from university research.

With this economic growth has come increased pressure for urban development and the problem is so serious that proposals have been made for Britain's first large new town since 1970 to soak up the growth. The government is generally against new towns, but may accept one near Cambridge if it can be shown there is no alternative.

Cambridge Futures

The Cambridge Futures Project was set up since Cambridge and its region are undergoing massive and accelerating change. Proponents have provided an evaluation of seven options on which to draw feedback and comment from stakeholders focussing on questions such as: What kind of place do we want our city and region to become? How will they shape up over the next 50 years?

Cambridge New Town

Proposal to build a new town for 50,000 people outside Cambridge were unveiled in October, 1998 and if it is approved it will be Britain's first new town since 1970, and the first to be privately funded since the second world war.

Cambourne and Cambourne Business Park

A busy town thriving on the excitement of international business. Cambourne will be home to up to 10,000 people who know that there is more to life than just work. Cambourne Business Park represents the next generation of working environment, where even the largest companies can find the flexibility they need to create the facilities they deserve.

Key Stakeholders

Proponents

- ***Cambridge Futures:*** Joint venture between local business leaders, politicians, local government officers, professionals and academics who have been identifying and assessing options for growth in and around Cambridge since 1996.

- **Cambridge New Town:** Promoted by Peter Dawe, an Internet entrepreneur. Adds to debate on locating 4.4m new households forecast for creation in England between 1991 and 2016. Coincides with proposals by Sir Peter Hall, member of government's urban taskforce, for three "social cities" of up to 250,000 people to be created 50 to 90 miles from London one of which could be a *City of Anglia* connecting Peterborough, Huntingdon, Cambridge and Stevenage.
- **Cambourne and Cambourne Business Park:** Development Securities, a property development and investment company, and Wrenbridge Land, a property development company based in Cambridge, experienced in development of office, laboratory and R&D facilities.

Scale of Investment

- **Cambridge Futures:** Seven options: (1) minimum growth; (2) urban consolidation; (3) "necklace development" allowing surrounding towns and villages to expand; (4) "green swap" - building on parts of the green belt but expanding it elsewhere; (5) building along public transport routes; (6) creating a "virtual highway" with a high-quality electronic communications system; (7) new town.
- **Cambridge New Town:** For 45,000 people by 2016 and 160,000 by 2051 - larger than Cambridge, which has 109,400 and constituting much of the growth projected for the proposed *City of Anglia*.
- **Cambourne and Cambourne Business Park:** 3000 homes in three villages linked to each other, the town centre and the business park by a network of roads, cycle paths, footpaths and bridleways. Business Park to comprise 750,000sf "top class" office accommodation, first phase of 100, 000sf under construction.

Cambridge Futures Project – Key Players

Principal participants of Steering Group: Professor Sir Alec Broers, Vice-Chancellor, University of Cambridge; Councillor John Durrant, Cambridge City Council; Michael Marshall, Chairman, Marshalls of Cambridge. Also involved Peter Dawe and Wyndham Thomas of Cambridge New Town Corporation (see below). Steering Group supported by Executive Committee with one full time member of staff and a budget of £100,000 raised by voluntary subscription. The Cambridge Futures research team is directed by Professor Marcial Echenique and is based at the Martin Centre for Architectural & Urban Studies of the University of Cambridge.

Cambridge New Town Corporation – Key Players

Inaugural chairman Peter Dawe has passed chairmanship to Wyndham Thomas, vice-chair Town and Country Planning (chaired by Sir Peter Hall) and former chief executive of Peterborough New Town Development Corporation.

Peter Dawe, founder Unipalm Pipex, the UK's first internet service provider, was recently appointed to membership of the Regional Development Agency for East Anglia by the Secretary of State for the Environment.

Cambourne and Cambourne Business Park – Key Players

Chris Read and Dan Van Gelder of Development Securities and Tim Holmes of Wrenbridge Land. The Cambridge agent is Jon Hutt. London agents are Mark England and Paul Smith.

Statement of Achievements

1. Achievements delivered by the project or activity in relation to the IDEA Project concept areas of:

Innovation – type, extent, success, method, etc.

- *Cambridge Futures*: Used computer simulations to analyse ways of coping with the most explosive population growth forecast in Britain over the next 50 years. The main findings of simulation-based appraisals of the above seven options for managing growth in the Cambridge region were as follows:
 - Minimum growth would protect Cambridge and its countryside but endanger prosperity.
 - Building more densely within the city, gradually replacing terraced and semi-detached houses with four-storey buildings or residential towers, would protect the country but worsen congestion in the city.
 - "Necklace development" - a continuation of current policies allowing surrounding towns and villages to expand - would double the cost of living in Cambridge by 2016 and hinder the economy.
 - "Green swap" - building on parts of the green belt but expanding it elsewhere - would support economic growth but cause congestion in the city.
 - Building along public transport routes, favoured by John Prescott, the deputy prime minister, would involve investment in the rail network - including reopening the Cambridge to St Ives railway - and it was uncertain how many people would stop using cars.
 - Creating a "virtual highway" with a high-quality electronic communications system had potentially beneficial effects, but it was unclear how many people wanted to work, shop and learn from home.
 - A new town would lead to exporters in the region facing a large increase in costs and the region's economy could become uncompetitive for the reasons given below.

Development - in a sustainable manner

- Building a new town outside Cambridge could relieve some of the region's environmental problems but would fail to accommodate the growth of high-technology industries according to the findings of the *Cambridge Futures* project.
- Planners must make long-term decisions this year that balance the need to protect Cambridgeshire's environment against encouraging high-technology industry in the main European competitor to California's silicon valley.
- The problem is so serious that proposals have been made for Britain's first large new town since 1970 to soak up the growth. The government is generally against new towns, but may accept one near Cambridge if it can be shown there is no alternative.

- A new town would be environmentally friendlier than most options because it would curb car emissions, by reducing congestion in the city, while preserving Cambridge and its green belt.

Employment - knowledge based employment outcomes, growth projections

- *Cambridge Futures* assess that a new town would involve restricting housing and employment growth elsewhere, and raise the price of homes, labour, rent and travel. Exporters would face a large increase in costs and the region's economy could become uncompetitive.

Application – including the degree to which spin-offs occurred and the extent of any emulation of the project or activity by others:

- The simulation approach developed by Cambridge Futures may provide useful guidance to the scenario formulation and social benefit cost analysis approach being developed by the IDEA Project. It could also be of value to the *Future Perth Scenario Planning Project*.
- In some ways the development of Cambourne as a town of 10,000 residents 9 kilometres from Cambridge could be viewed as part of the growth of the proposed *City of Anglia* and a forerunner to the proposed much larger *Cambridge New Town* five to 10 miles from the city on the military property at Oakington.
- *Cambridge New Town* adds a fresh dimension to the debate about where to put 4.4 million new households forecast for creation in England between 1991 and 2016.
- It coincides with the proposals for three "social cities" of up to 250,000 people.
- Both proposals challenge the prevailing orthodoxy that Britain's housing problems, and pressure on the countryside, can be solved by persuading people to move back into existing towns and cities.
- Peter Hall considers the government is unlikely to achieve its target of building 60 per cent of new homes on recycled, or brownfield, land within 10 years. He estimates 40 or 50 per cent and warns against shoe-horning people into "all sorts of inappropriate sites".
- In the creation of the *City of Anglia*, Peter Hall wants to see the creation of clusters of settlements of 10,000-30,000 people - some expansions of existing settlements, others new.

2. Achievements related to the attraction of enterprises and clusters of enterprises, and investment attraction.

Finding the appropriate form of urban development in the region viewed by many as Europe's answer to Silicon Valley will improve the performance of the UK economy, directly and possibly to an even greater extent through demonstration impacts. While the post war boom in new towns in the UK has drawn much criticism, central, local government and some entrepreneurs and developers are seriously considering this approach again. The quality of methods to appraise this and a wide range of other options is probably markedly better today than 50 years ago.

Achievements need to be assessed against the degree to which the seven options are already unfolding. It has been realised that in practice, local authorities are likely to opt for a range of options. It is understood that *Cambridge Futures* are proposing to use simulation analyses to appraise scenarios comprising various combinations of the seven options.

Appraisals of the seven options individually and in combinations needs to examine the issues of investment and enterprise attraction.

Alliances Achieved

In the words of the developers, with the first phase of 100,000sf of top class office accommodation already under construction Cambourne is set to be the number one pure office park in Cambridge.

Appraisals of the seven options individually and in combinations also needs to examine the propensity of options and combinations of options to create the conditions for business and enterprise alliances and the attendant formation of clusters.

KALUNDBORG PROFILE

Project Name: Evolution of Industrial Symbiosis at Kalundborg in Denmark

Descriptive Title: The world's leading example of industrial ecology
(The objective of industrial ecology is to understand better how to integrate environmental concerns into economic activities by assessing:

- The flows of materials and energy in industrial and consumer activities.
- The effects of these flows on the environment.
- The influence of economic, regulatory, and social factors on the flow, use, and transformation of resources.)

Abstract

The most advanced demonstration of *industrial ecology* or industrial symbiosis is the flow of resources and by-products between participating enterprises in the pioneering *industrial ecosystem* at Kalundborg, depicted in Figure 1. Kalundborg, a harbour town with buildings dating back to the 12th Century, is located 100 km west of Copenhagen.

This development at Kalundborg has attracted a great deal of international attention including the EC Commission. It has been awarded a number of environmental prizes.

The development is **not** the result of a careful planning process but rather a result of a gradual development of co-operation between four neighbouring industries and the municipality of Kalundborg. From the initial stage where things happened by chance, this co-operation has now developed into a high level of environmental consciousness, where the participants are constantly exploring new avenues of environmental cooperation.

This evolution has led to a co-operation between different industries, by which the presence of each of them increases the viability of the others, and by which the demands from society for resource conservation and environmental protection can be taken into consideration.

Key Stakeholders

Proponents

The main participants in this development are:

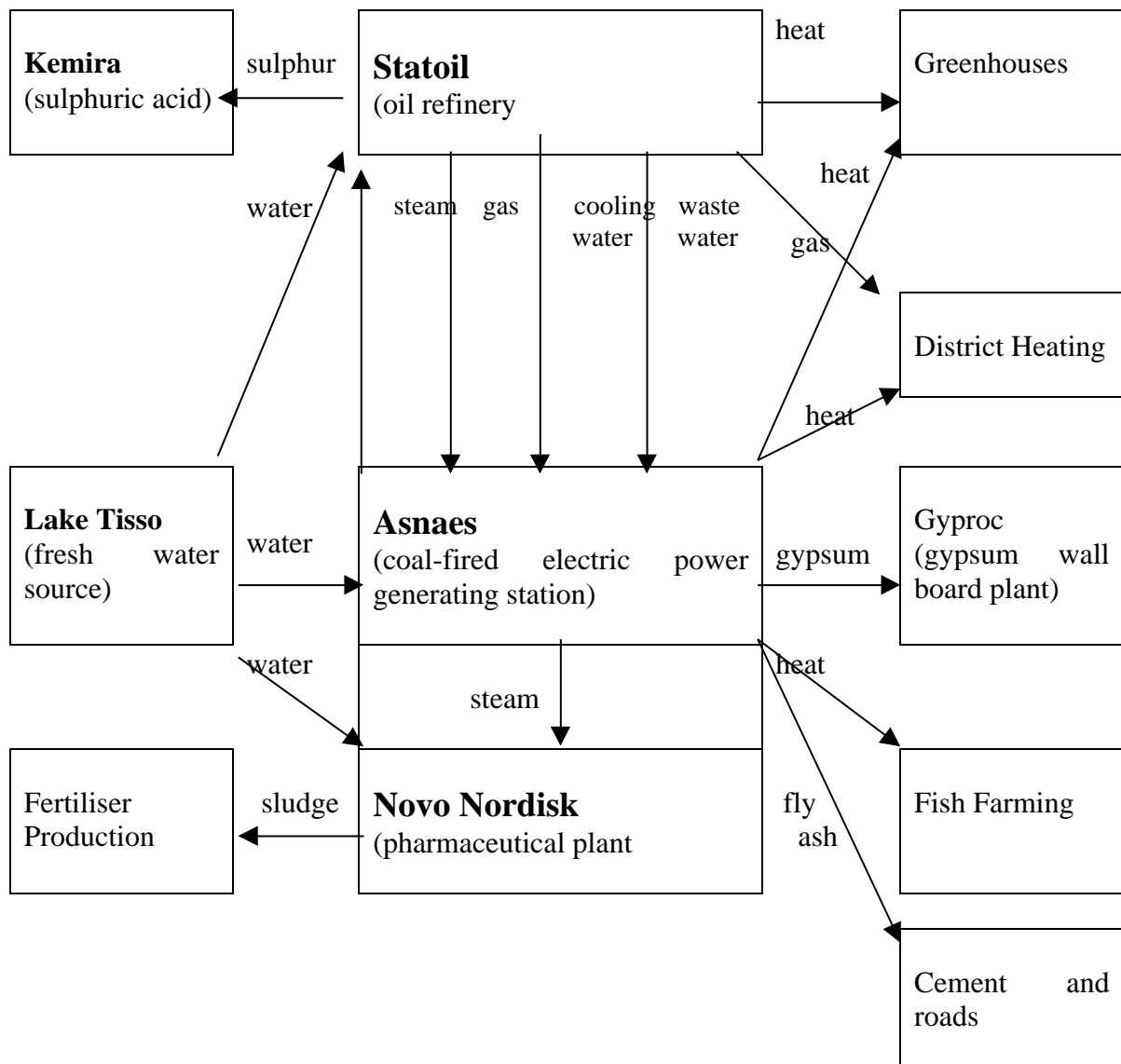
- **Asnaes**, a coal-fired power-generation plant.
- **Statoil**, an oil refinery.
- **Novo Nordisk**, an international biotechnological company producing pharmaceuticals and industrial enzymes.
- **Gyproc**, a plaster manufacturer.
- **Kalundborg Municipality**, the responsible authority for the provision of water, electricity and district heating.

Scale of Investment

Asnaes is the largest power plant in Denmark and employs some 600 people. **Statoil**, the largest refinery in Denmark producing 5 million tonnes of oil per annum, employs 250. **Novo Nordisk**, with annual sales over \$2 billion, produces 40 percent of the world’s insulin and 50 percent of the world’s market in enzymes and has 1,566 employees of whom 1,034 work in its Kalundborg plant. This is the company’s largest plant of four in Europe. It is still expanding rapidly. **Gyproc** manufactures some 14 million m² of plaster per annum and employs 175 people. The **Kalundborg Municipality** is the responsible authority for the provision of water, electricity and district heating for 4,000 residents.

Through 1993, the \$US60 million investment in infrastructure (for transport, energy and materials) has produced \$US120 million in revenues and cost-savings.

Industrial Ecosystem at Kalundborg



Statement of Achievements

1. Achievements delivered by the project or activity in relation to the IDEA Project concept areas of:

Innovation – type, extent, success, method, etc.

An insight can be gained into this successful cooperation by summarising the various characteristics leading to the-is innovative outcome at Kalundborg. These have been identified as:

- Industries involved in the cooperation must be different but fit together.
- Individual industry agreements are based on commercially sound principles.
- Environmental improvements go hand in hand with resource conservation and economic incentives.
- Cooperation is voluntary and in close collaboration with regulatory agencies.
- Short physical distances are an advantage.
- Short mental distances are critical.

Development - in a sustainable manner

The emergence of eco-industrial infrastructures has been characterised by the following continuum:

1. Compliance.
2. Partial recycle initiatives.
3. Development of environmental management tools.
4. Highly developed closed-loop recycling.
5. Significant changes in products and packaging.
6. Environmentalism fully integrated in corporate culture.
7. Synergistic industrial ecosystems developing.
8. Full industrial ecology.

Will many industries and enterprises are still resisting taking the first step of *compliance* along this continuum, the industrial symbiosis at Kalundborg is reaching for *full industrial ecology*.

Specific benefits of this cooperation include significant reductions in:

- *Resources inputs*:- 19,000 tpa oil; 30,000 tpa coal; 1.2 billion litres pa fresh water.
- *Emissions*:- 130,000 tpa carbon dioxide; 25,000 tpa sulphur dioxide.
- *Traditional 'wastes' by re-directing them as raw materials for production*:-135,000 tpa fly ash; 2,800 tpa sulphur; 80,000 tpa gypsum; 800 tpa nitrogen from biosludge; 400 tpa phosphorus from biosludge.

To look at one of the participants in more detail, the Asnaes power station has annual consumption of resources and production of products and by-products as follows:

- **Consumption**
400,000m₃ (treated water) from the municipal system; 100,000m₃ (raw water) from Lake Tisso; 700,000m₃ (re-used cooling water from Statoil); 500,000m₃ (re-used from wastewater from Statoil); 1,600,000 tonnes coal; 25,000 tonnes oil; 5,000 tonnes gas (from the Statoil flare)
- **Production**
4.3 billion kWh electricity; 355,000 tonnes process steam used in adjoining industries; 700,000 GJ district heating; 170,000 tonnes fly ash; 200 tonnes fish; 80,000 tonnes gypsum.

Employment – knowledge-based employment outcomes, growth projections

The quest to achieve *full industrial ecology* makes great demands of mutual information and cooperation when operational adjustments are made. For example, Gyproc must be notified in advance if they have to switch to liquid gas instead of deliveries from Asnaes. But this cooperation has also meant that companies have got to know each other even better, cooperating on training, for example.

Thus an increasing number of the jobs provided by the various enterprises, some of which were noted above, will be knowledge-based to deliver not only planned outcomes for the enterprises of Kalundborg but also to advise other initiatives throughout the world now attempting to emulate these achievements.

Application – including the degree to which spin-offs occurred and the extent of any emulation of the project or activity by others:

This case study of Kalundborg shows only the tip of the iceberg of the wide range of environmental applications that can assist industry, commerce and the wider community. These technical solutions, put to use in the growing world market for environment products, many of which are virtually on our door step, provides a tremendous opportunity for many parts of Australia including the clustering of enterprises that will operate from St Andrews.

In the USA the President's Council on Sustainable Development has provided seed funding for strategic plans for development of *eco-industrial parks* (EIPs) at several 'brownfield' sites. The Council, comprising senior representatives of business, environmental, government, community and labour organisations, sees EIPs as a promising development for the future. There are EIPs in various stages of development in several cities including: Baltimore Maryland, Brownsville Texas, Cape Charles Virginia, Skagit County Washington, and Chattanooga Tennessee. A few years ago the Japan External Trade Organisation published a special issue of 'New Technology Japan' focusing on the 'Eco-Factory'.

Operating companies are finding the concept compelling as well. Quad Graphics, the leading colour printing company in the US (over \$1B in revenue) is considering an EIP. This is focused on printing as the 'anchor industry', with associated facilities that could include a paper mill feeding on the vast 'urban forest' of recyclable paper, a de-inking facility that derives useful products from the 'waste' ink, and other related activities. R&D directed to greatly reducing the energy and water inputs to the semiconductor and computer chip manufacturing is well advanced.

2. Achievements related to the attraction of enterprises and clusters of enterprises, and investment attraction

In addition to Asnaes, Statoil, Novo Nordisk, Gyproc and the Kalundborg Municipality, other enterprises and industrial activities that have emerged include the following:

- Novo Nordisk supplies biological sludge to the neighbouring farms for fertiliser.
- Asnaes supplies fly ash to a nearby cement works, Aalborg Portland.
- Asnaes uses “waste” heat for aquaculture production.
- Statoil operates a sulphur-recovery plant to produce elemental sulphur for use in the production of sulphuric acid by Kemira.
- Statoil has a pipeline to supply biologically treated refinery effluent to Asnaes for cleaning water and fly ash stabilisation.
- Greenhouses utilise residual waste heat from Asnaes and Statoil.

Alliances Achieved

Since 1959, when Asnaes was first fired up, many alliances and interrelated activities have been built into the system including those in the following chronology:

- 1961: Statoil commissioned and a pipe for fresh water from Lake Tisso constructed.
- 1972: Construction of the Gyproc factory and the piped supply of excess refinery gas providing a source of energy for manufacturing.
- 1973: Asnaes enlarged and additional water provided by way of the ‘wastewater’ from Statoil.
- 1976: Novo Nordisk started supplying biological sludge to the neighbouring farms for fertiliser and surplus yeast from insulin production for pig food.
- 1978: Asnaes commenced supply of fly ash to the cement works, Aalborg Portland.
- 1981: Kalundborg Municipality completed a district-household-heating-distribution network throughout the city using ‘waste heat’ from Asnaes. Encouraged by the city and the Danish government, this led to the replacement of about 3,500 oil furnaces (a significant non-point source of air pollution).
- 1982: Statoil and Novo Nordisk completed construction of a steam supply from the Asnaes to replace their own, less efficient, steam boilers.
- 1987: Statoil completed a pipeline for the supply of cooling water effluent to Asnaes for use as raw boiler feed water.
- 1989: Asnaes uses salt water, from the fjord, for some of its cooling needs. By doing so, it reduces the withdrawals of fresh water from Lake Tissø. The resulting by-product is hot salt water, a small portion of which is supplied to the fish farm's 57 ponds.
- 1990: Statoil completed construction of a sulphur-recovery plant to produce elemental sulphur that is trucked to Kemira, a sulphuric acid producer.
- 1991: Statoil commissioned a pipeline for the supply of biologically treated refinery effluent to Asnaes for cleaning water and fly ash stabilisation.

- 1992: Statoil commissioned a pipeline for the supply of refinery flare gas to Asnaes as a supplementary fuel.
- 1993: Asnaes completed a stack flue-gas desulphurisation project to convert flue-gas (sulphur dioxide) to calcium sulphate (gypsum) which was used to replace the imported natural gypsum as a raw material. This by-product actually produces a higher quality product than the natural gypsum.
- 1994: greenhouses constructed to utilise residual waste heat from the Asnaes and Statoil.
- 1998: Novo Nordisk agreement with the Municipality of Kalundborg on receiving more surface water from Lake Tissø in order to conserve ground water yielding a 14% reduction in the 1997 consumption of drinking water per unit produced.
- 1998: Novo Nordisk agreement with Danish Energy Agency on increased investment in energy-saving measures over the next three years.
- 1998: Novo Nordisk agreement with Sydkraft in Sweden on the purchase of electricity produced by hydroelectric power stations.
- 1998: Novo Nordisk initiated the establishment of an Environmental Management System (EMS) based on ISO 14001 for its enzyme business - accounting for by far the greatest consumption of resources and the most significant environmental impact. All environmental factors in the area will be mapped during 1999, as the basis for the design of the EMS. This systematic effort involves the active participation of all production staff to prepare the EMS for certification by 2000.

What can we learn from this experience in alliance formation over the past three decades? Comments from those directly involved include:

- All contracts have been negotiated on a bilateral basis.
- Each contract has resulted from the conclusion by both companies involved that the project would be economically attractive.
- Opportunities not within a company's core business, no matter how environmentally attractive, have not been acted upon.
- Each partner does its best to ensure that risks are minimised.
- Each company evaluates their own deals independently; there is no system-wide evaluation of performance, and they all seem to feel this would be difficult to achieve.

MERKUR CO-OPERATIVE BANK AND GAIA TRUST PROFILE

Project Name: The *Merkur Co-operative Bank* and the *Gaia Trust*

Descriptive Title: A bank and trust supporting the development and marketing of eco-villages and ecologically sustainable or 'green' businesses and technologies.

(**Gaia hypothesis:** the Earth is a living organism. James Lovelock's book *Gaia: The practical science of planetary medicine* explores this hypothesis, by assessing planetary health, diagnosing sicknesses, and prescribing recovery treatments. Review comment from New Scientist: "Lovelock is a brilliant writer.")

Eco-villages: an integrated solution to the global social and ecological crisis, and are as appropriate to the industrialised world, both urban and rural, as to the remaining two thirds of the world; a modern attempt for communities to live in harmony with nature and with each other; a "leading edge" in the movement towards developing sustainable human settlements, providing a testing ground for new ideas, techniques and technologies that can then be integrated into the mainstream.

Green businesses: work towards a cleaner environment, reduced use of natural resources, production of high-quality food, and utilise environmentally sound means of production. Establishment is a demanding task since the institutions that traditionally finance business ventures are often quite sceptical. Those taking the initiative typically have strong beliefs in their ideas and a deep ecological commitment, but often have little experience in production, marketing or business management. Facing difficult financial requirements and hard competition means that the green business ventures need special, comprehensive support to get through the difficult start-up phase and to gain strength to survive and be successful in the long run.)

Abstract

Established in 1982 the Merkur Co-operative Bank has been instrumental in securing the essential capital and financing for more than 500 social and ecological initiatives and projects, throughout Denmark and abroad. Each enterprise makes up a piece of the puzzle towards a more sustainable society. Included are: schools and kindergartens, homes for the mentally handicapped, educational institutions/museums, student grants, doctors and the health care, trades and businesses, alternative energy systems, village co-operatives, co-housing co-operatives, bio-dynamic farming, ecological small-holdings, and many others.

The *Gaia Trust*, founded in 1987, is a Danish charitable co-operative society financing sustainable technologies and ecological projects of demonstrable value through the *Global Eco-village Network* (GEN) and *Gaia Technologies A/S* referred to as *Gaia Tech*.

Gaiacorp Ireland, part of the *Gaiacorp* group of companies, is independently owned by *Gaia Trust*. *Gaiacorp* is a currency management company established in 1988 to advise on and manage foreign exchange exposure for international institutional investors. Marketing and trading take place in the International Financial Services Centre in Dublin and offices in London and Hong Kong.

Key Stakeholders

Proponents

A public cooperative bank, the *Merkur Co-operative Bank* aims to make banking a transparent business. Customers exert an influence as to how their money is used and they are kept informed of the process. Close to 50% of the Bank's 3,000 customers in Denmark have accepted the offer to become joint owners by buying one or more shares at 1000 kr. each.

The Bank is officially represented in Germany by Trion Geldberatungsgenossenschaft of Hamburg. Through this office contact is made with customers, primarily in northern Germany. Deposit transactions, as well as loans held in D-marks are without any exchange rate risk for German-based customers.

Gaia Trust is a Danish charitable entity founded in 1987 with the objective of promoting the view that whole planet is a living organism and supporting the desire by many to live in ecologically sustainable settlements through the *Global Eco-village Network (GEN)*. *Gaia Villages*, a division of *Gaia Trust*, acts as the International Secretariat for *GEN* - a network of small eco-village projects around the world.

The Bank in collaboration with *Gaia Trust* established *Gaia Tech* in 1993 as a commercial venture capital company with the objective of supporting the development and marketing of 'green' businesses and technologies in Denmark.

Besides *Gaia Tech's* investments in ecological businesses, *Gaia Trust* has invested directly in businesses that, like itself, work in the field of promoting and assisting projects that strive toward a more sustainable social development including:

- Merkur Co-operative Bank.
- Gaia Books Limited (UK), an independent publisher and packager of many well known environmental books including James Lovelock's *Gaia*.

Gaiacorp Ireland, part of the *Gaiacorp* group of currency management companies, is independently owned by *Gaia Trust*. *Gaiacorp* advises and manages foreign exchange exposure for international institutional investors operating from the International Financial Services Centre in Dublin and offices in London and Hong Kong.

Scale of Investment

The *Merkur Co-operative Bank* has been instrumental in securing the essential capital and financing for more than 500 social and ecological initiatives and projects, throughout Denmark and abroad.

Gaia Trust has provided grants through *GEN* to over 80 projects in 20 countries. It has developed a proposal for funding of \$US100 million to be allocated to an international United Nations committee for the support and development of from 50-70 small eco-villages (up to 2,000 inhabitants) in both urban and rural areas across the globe. The primary objective is to establish successful examples of sustainable living in the 21st century, with the intention of providing models for replication.

The *Gaia Tech* portfolio includes investments in companies producing dry goods, organic cereals, alternative banking, organic meats, solar cell panels, and small windmills. Specific investments include:

- *Gaiagrain A/S* - produces ecological breakfast foods.
- *Gaia Solar A/S* - a solar energy business which has, among other projects, provided solar cells to a Danish electrical utility company. This project was the first Danish photovoltaic system connected to a traditional electrical grid.

- *Gaia Wind Energy A/S* - manufacturers of small, effective 5 KW, 11 KW and 22 KW windmills.
- *Grindsted Dairy* - produces organic cheeses for sale in Denmark and export to Germany and England.
- *Hanegal Ecological Meats* – developers of a container-based, farm slaughter system for organically raised pigs and cattle.
- *Urtekram* - produces and distributes a wide range of organically produced dry foods and shampoos.

The *Danish Association of Sustainable Communities*, abbreviated to *LØS* in Danish, is a forum for the exchange of ideas and experience, and by cooperating with politicians, planning authorities, financing institutions and private groups the association works for the establishment of new urban and rural communities. *LØS* has received grants from various foundations, including *Gaia Trust*, *The Green Fund* of the Ministry of Energy and Environment, and the Council for Recreation and Open Air Activities.

Statement of Achievements

1. Achievements delivered by the project or activity in relation to the IDEA Project concept areas of:

Innovation – type, extent, success, method, etc.

An important eco-village issue is how to make technology ecologically, socially and spiritually responsive to human needs, rather than the opposite. A closely related issue is the creation of jobs in eco-villages. Technology tends to determine the structure and organisation of society. Contemporary society's technology promotes unliveable megacities, separation of work and home, institutionalisation of family support functions, environmental degradation, unsustainability, and over-consumption, in a centralised, hierarchical structure.

The *GEN* vision requires a radical change in structure that would reverse these tendencies. An important part of *GEN's* strategy is the promotion of sustainable technologies. The long-term vision is to provide sustainable jobs in eco-villages by technology exchange and co-operation. Three key criteria have emerged in assessing appropriate technologies for eco-villages, over and above commercial viability:

- (1) Ecological sustainability.
- (2) Human scale, decentralised production.
- (3) Allowance for a non-stressful, meditative lifestyle. It is recognised that the realisation of this vision will take some time.

The Australian innovation of permaculture (permanent agriculture) has played a prominent role in the delivery of (1) and (2) in many of eco-village projects throughout the world. Permaculture is the conscious design and maintenance of agriculturally productive ecosystems that have the diversity, stability and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter and other material and non-material needs in a sustainable way.

Development - in a sustainable manner

Sustainable development projects using *Mercur* as their financial institution and supported by *Gaia Trust* include:

- **Eco-Villages** in Hundested, Lading, Hjortshoj and Herskind are habitats and co-housing developments, experimenting with lifestyles and ways of living together, the use of energy and resources and new forms of ownership.
- **Vital Homesteads:** initiatives comprise a large number of bio-dynamic and ecological farmsteads, from small family holdings to larger ones of up to 100 hectares. Co-ownership, shared resources and exploring new forms of ownership are a part of many of these projects, as are homeosteria - small farm shops or speciality shops, selling for instance, goat cheeses.
- **Renewable Energy:** supporting the use of windmills and solar panels. Loans have also been obtained from the Nordvestjysk Folkecenter for Renewable Energy.

Employment - knowledge based employment outcomes, growth projections

In establishing *Gaia Tech* as a commercial venture capital company, supporting the development and marketing of ecologically sustainable businesses, the focus has been on businesses which in the long term are suitable to eco-villages and which can provide jobs for the inhabitants of these settlements.

Active financial, legal and marketing support is provided to young, promising, 'green' businesses. The focus is primarily on businesses that work toward a cleaner environment, reduced use of natural resources, production of environmentally friendly products, and using environmentally friendly means of production.

In addition to the creation of 'green' jobs flowing from the foregoing sustainable development activities other 'green' employment initiatives that have been supported include:

- **Commerce:** enterprises obtaining commercial support include manufacturers materials, such as natural dyes, non-toxic paints, eco-based cleaning supplies, health foods, eco-toys and textiles.
- **Health Food:** food-production enterprises like dairies, bakeries and creation of 'ready - prepared dishes', all using ecologically grown ingredients for their products, and delivering to small shops, as well as larger chains. As are various eco-restaurants offering meals prepared with ecologically produced foods.
- **Health Service Programs:** homes for retarded children, therapeutic farm-based homes for retarded adults, and co-housing centres for mentally retarded and 'normal' functioning adults.
- **Art and Culture:** community centres and art galleries in Aarhus, Halkaer and Kobenhavn, as well as publishing companies and craft studios. An example is *Det Grafiske Vaerksted* (The Graphic Workshop) in Hjørring, which is being used by more than 50 artists from Nordic countries.
- **Free Schools:** about 20 free schools and kindergartens, several colleges and other educational institutions like *Den Okologiske Landbrugsskole* (School for Ecological Land Use) in Aabybro, and schools for "Eurytmi" in Aarhus and Kobenhavn.

Application – including the degree to which spin-offs occurred and the extent of any emulation of the project or activity by others:

Society's existing laws, mentality, administration, research, financial structures are not geared toward supporting the development of eco-villages. Accordingly, *Gaia Villages* has focussed on supporting pioneer projects that can serve as examples to others through *GEN* at the global level and *LØS* in Denmark. *Gaia Villages* provides a secretariat for *GEN* and supports permaculture courses in selected countries because this curriculum, which includes the design of sustainable communities, can often be the first step in the founding of an eco-village.

The promoters of *GEN* take exception to the notion of an eco-village being a traditional low-tech rural village rejecting modern technology. Rather they emphasise the importance of the social dimension of 'community', whether it is in a rural or urban setting. Most eco-villages in developed countries at present are rural, primarily because it is easier to initiate a project on a new piece of land. Urban eco-villages are an important part of the future, but they are far more difficult to establish in developed countries due to an unfriendly infrastructure and lack of clear boundaries. An additional problem is that it is more difficult to form a homogeneous group with common goals out of an existing community than to form a new one. Most sustainability efforts to date in the cities have focused on retrofitting the physical facilities using public funds. This is an important step forward, but it is not enough. It is not the same as establishing 'community'. Indeed, many such experiments leave residents as isolated as before. The social aspect, the 'glue' that holds people together in a common vision is lacking. The urban eco-village concept puts much more weight on the people aspect.

The *GEN* information database established on the Internet at <http://www.gaia.org> is expanding quickly, having over 600 pages already. Information on the following is progressively coming online:

- Profiles of all member eco-villages who wish to present themselves to the world.
- 'How to' manuals for new communities.
- A number of special interest groups on e-mail (financing, permaculture, ecological building, Habitat II follow up, etc.)
- Links to other organisations of interest, including providers of 'green products' across the globe.

The promoters of *GEN* welcome all interested individuals and entities to join the *GEN* regional networks without conditions.

2. Achievements related to the attraction of enterprises and clusters of enterprises, and investment attraction.

Many of the enterprise and clusters of enterprises that have attracted investment from *Merkur*, *Gaia Trust* and other related sources are noted in the foregoing.

Alliances Achieved

Over the past six years, a 'seed group', diverse in make-up, history, and state of evolution has been in communication and gradually evolving into *GEN*. These include: *Findhorn Community*, Scotland; *The Farm*, Tennessee, USA; *Lebensgarten*, Steyerberg, Germany; *Crystal Waters*, Australia; *Ecoville*, St. Petersburg, Russia; *Gyûrûfû*, Hungary; *The Ladakh*

Project, India; *The Manitou Institute*, Colorado, USA; and the *Danish Association of Sustainable Communities*. These were chosen for a variety of reasons, including geographical spread, attractiveness as models, ecological and spiritual awareness, and personal contacts. *GEN* was looking for the best possible examples of sustainable communities in existence anywhere. None were considered perfect models, but all had something vital to contribute.

The realisation of the *Gaia Trust* proposal for an UN-based eco-village support program would lead to many other alliances.

Similarly, the Local Initiatives Awards of the International Council for Local Environmental Initiatives and the Saitama Prefecture Government in Japan are likely to identify many prospective alliances with *GEN*. These awards were established to give international recognition to outstanding environmental performance by local governments working in cooperation with other community partners.

Local governments around the world are being called upon to shoulder increasing responsibility for environmental problems. In response, many of them have made outstanding efforts to address environmental concerns through creative measures that not only offer concrete results in their own communities, but have the potential to serve as models for other local governments world-wide.

The Awards will be granted for excellence in projects in the following five categories:

- **Governance for Sustainable Development**, based on Local Agenda 21 and sustainable development processes.
- **Land Resources Management**, for soil protection, habitat and biodiversity protection, and land-use planning for urban liveability.
- **Freshwater Management**, for water quality improvement and water supply management.
- **Atmospheric Protection**, for climate protection and air quality improvement.
- **Waste Management**, for solid waste, toxic waste and consumption patterns.

MONTPELLIER PROFILE

Project Name: Montpellier L. R. Technopole, France

Descriptive title: The Montpellier Languedoc-Roussillon (L. R.) Technopole is a cluster of five 'disciplines' or 'poles' of development which have become a focus of education, research, development and commercialisation in the fields of data processing, robotics and artificial intelligence; media; biomedical and pharmaceuticals; agronomy and agricultural processing; and tourism.

Abstract

A local council ambition initiated in 1962 to capitalise on the area's ideal climate and location sought to develop the city into a hub for attracting clean industry while at the same time increasing tourism. The industries to be attracted were those it was felt Montpellier had a comparative advantage over, initially in the European market and eventually the world markets.

Montpellier developed a coordinated approach to economic development, linking town planning, the arts, tourism, universities, research laboratories and clusters of businesses. medicine, agricultural science, IT, multimedia and telecoms and tourism.

Today, the Montpellier Languedoc-Roussillon Technopole is a cluster of five 'poles' of development, each a centre of excellence in its field:

- Data processing, robotics, computerised finance and artificial intelligence centre. Development commenced in 1963 with the arrival of IBM;
- Media centre. Considered to be Europe's 'global village';
- Biomedical and pharmaceutical centre. Montpellier was home to the first medical facility in the Western world founded in 1220 AD. The Euromedicine conference is held annually and attracts more than 50,000 visitors including 15,000 doctors and researchers;
- Agronomy and agricultural processing industry development centre. This centre has many Institutes of Research with over 1,800 researchers into agro-industrial and agricultural processing ; and
- Tourism centre. Montpellier has major conference facilities and other tourism infrastructure.

Each of the poles are outlined in **Annex 1** to this Profile.

The Languedoc-Roussillon Region consists of five 'départements', covering 27,376 sq.km and with a population of 2,182,600. Montpellier itself is home to 212,000 people. With its surrounding 'communes', the city and its suburbs have a population of 350,000.

Five hours from Paris by TGV, Montpellier has over 52,000 students in three universities and six major colleges. It has a youthful, outward-looking population:

- 55% of Montpellier's inhabitants are aged under 25
- 80% of the city's population comes from outside Montpellier.

See <http://www.tech-montpellier.com/english.html> for additional information.

Key Stakeholders

Until 1962 the city of Montpellier relied on education, tourism and retirement for economic growth. At that time the city council decided it should capitalise on the area's ideal climate and location and develop the city into a hub for attracting clean industry while at the same time increasing its tourism base.

An aggressive strategy was implemented based on three (3) essential objectives:

- To aid and support the creation of new businesses.
- To facilitate the introduction of new technologies into existing companies and activities.
- To accommodate arriving companies and activities in the most favourable conditions possible.

The instigator of the local initiative was Georges Frêche, Mayor of Montpellier, Member of Parliament, President of Montpellier District, and Founding President of Montpellier Mediterranean Technopole.

Today, Patrick Peyre is President of Montpellier Mediterranean Technopole, and General Manager Itineris Center of Montpellier

Highlighting and promoting the city's scientific and technical potential is overseen by a formal association of local government officers, representatives of the Chamber of Commerce, local banks and financial institutions, industry representatives and education and research groups.

Some twenty (20) members of the Town Association meet monthly to review the latest applications for industry location and to informally discuss any problems. This provides a valuable research-government- industry cross fertilisation.

Statement of Achievements

1. Achievements delivered by the project or activity in relation to the IDEA Project concept areas of:

Innovation – type, extent, success, method, etc.

Georges Frêche claims that the combination of natural beauty, history and modern man-made infrastructure have all been combined to provide a favourable economic and social climate for modern business to locate in. He notes the success of the Technopole is particularly due to:

- Easy transport: with the TGV, an international airport, the seaport of Sete and highways and tollways providing links to other European cities.
- Organisational assistance: in addition to conventional assistance such as telecommunications and helping to locate appropriate sub-contractors, the Town Association also offers an innovative data bank (via optic fibre) on business opportunities in greater southwest France, a list of all businesses involved in Montpellier, a matching service between industry and the R&D laboratories, an employment data base, assistance on housing, and the requirements for starting a business at Montpellier.

- A concern for quality: The aim of Montpellier is ‘zero defects’ and it is administered through *Qualipole L. R.* in which IBM and the Regional Director of Industry and Research play a leading role. Two enterprises have their core business in providing support to this initiative: APAVE offers precision dimensional measuring, chemical and metallurgical analysis and dielectric measurement; and the Fair Trade Bureau which provides a fully equipped laboratory providing analytical support and an efficient form of arbitration when needed.
- Incubators: Businesses that have been in operation for less than one year and that have an innovative product may be accepted by the Town Association as tenants into ‘Cap Alpha’, a community sponsored incubator. This offers start-up businesses a logistical base for up to 23 months at less than commercial rates.
- Educational Infrastructure: World class universities with more than 80,000 students are enrolled on post-Baccalauréat (18 years +) courses in Montpellier: Post Graduate 14%; Higher Technology and Pre-Graduate 13%; University 73%

Development - in a sustainable manner

For over 10 years, the District of Montpellier has been investing in land and establishing business and technology parks. With over 500 hectares (1,100 acres) available, the right site or premises can be offered to incoming or expanding businesses. The business and technology parks include:

PARC CLEMENT ADER

- located in the Commune de Jacou
- 5 hectares in total
- 3 hectares still available
- 27 businesses, employing 252 people.

PARC EUROMEDECINE

- located in the Communes of Grabels and Montpellier
- technology park for medical and life sciences activities
- 170 hectares in total
- 70 hectares available
- 208 businesses (5,940 jobs).

PARC DE MASSANE

- located in the Commune de Baillargues
- 25 hectares in total
- 15 hectares available
- under construction.

PARC GAROSUD

- located in Montpellier
- designated for transport and logistics activities
- 60 hectares in total
- 39 hectares available
- 450 businesses (7,000 jobs).

PARC MARCEL DASSAULT

- located in the Saint Jean de Védas commune
- 43 hectares in total
- 1 hectare available
- 97 businesses (1,288 jobs).

PARC DU MILLENAIRE

- located in Montpellier
- designated for electronics, IT and multimedia companies
- 44 hectares in total
- 9 hectares available
- 258 businesses (4,573 jobs).

PARC DE LA MEDITERRANEE

- located in the Commune de Pérols
- 25 hectares in total
- 20 hectares available
- 7 businesses (60 jobs).

PARC VALLEE DU SALAISON

- located in the Commune de Vendargues
- 120 hectares in total
- 3 hectares available
- 91 businesses (1,690 jobs).
-

Montpellier also offers enterprises short-term offices and workshop premises. The District of Montpellier has 22 units available, representing a total of 6,000 m². This provides a short-term solution to new or incoming companies, before they move into long-term premises on one of the District's business parks. Short-term premises are available in :

- Baillargues : 1,150 m², consisting of 12 modules of 125 m²
- Montpellier-Millénaire : 1,525 m², consisting of 4 modules of 150 to 700 m² each
- Prades-le-Lez : 1,125 m², consisting of 10 modules 112 m².each
- Vendargues : 1,940 m², consisting of 7 modules of 260 to 670 m².

Innovative design is a feature of Antigone, a complex developed on a 35 ha site in downtown Montpellier on the banks of the River Lez. Designed by Ricardo Bofill, it forms a link between the commercial centre and the start of the residential sections. Antigone contains 2,300 apartments, 50% for sale and 50% for rent with half of each earmarked for low to middle income housing. Antigone also contains schools, gymnasiums, a church, the city's labour union building, the regional government's offices and the port of Mariane.

Employment - knowledge based employment outcomes, growth projections

There are over 26,000 businesses operating in Montpellier. The annual rate of new business start-ups in Montpellier is 15.5% (compared with 13% nationally).

The structure of employment in the Languedoc-Roussillon region is:

- 11.2 % Manufacturing
- 7.1 % Construction
- 22.0 % Commerce
- 59.7 % Services

Montpellier has a growing employment base. In 1995, employment grew by 1.1% in the District of Montpellier, compared with 0.9% in France as a whole. A recent survey predicts that Montpellier's working population will double between 1990 and 2020.

Application – including the degree to which spin-offs occurred and the extent of any emulation of the project or activity by others

The IBM facility created significant demand for spin-off activities, a number of which have been founded by ex IBM employees with the help of their former company.

There are over 50 foreign-owned companies in Montpellier, from 15 different countries. Seven foreign countries, from northern Europe and around the Mediterranean, have diplomatic representation in Montpellier.

2. Achievements related to the attraction of enterprises and clusters of enterprises, and investment attraction.

Montpellier, capital of the Languedoc-Roussillon region, is France's 5th most important centre for research. The city's economic growth depends on this scientific and technological research, in both the public and private sectors.

There are currently 8,000 researchers working in Montpellier, mainly in medicine and healthcare, agricultural science and communications technology.

In terms of employment costs, the Languedoc-Roussillon region is one of the most competitive in France (salaries in the region are 8% below the national average).

Montpellier has the highest population growth rate in France, and the second highest in the European Union. Population growth in the District of Montpellier is running at 1.4%, compared with a national average of 0.5%.

World Trade Center Montpellier Méditerranée Technopole

As part of the worldwide network of three hundred World Trade Centers, WTC Montpellier Méditerranée Technopole aims to promote and inform the many hundreds of exporting and importing companies in the Languedoc-Roussillon region.

Members of WTC Montpellier Méditerranée Technopole, through their membership card, have full access to trade and logistical services provided by all 300 WTCs.

Alliances Achieved

World Trade Centers (WTC) Montpellier Méditerranée Technopole works in close partnership with the following French trade organisations:

- Le Centre Français du Commerce Extérieur (CFCE) : a whole host of international trade information.
- La Direction Régionale du Commerce Extérieur (DRCE) : the regional link with the 166 Commercial Services of French Embassies (Postes d'expansion économique - PEE).
- Douanes : Customs information
- Le Club des Exportateurs : the Exporters' Club of Montpellier.

WTC Montpellier Méditerranée Technopole is a correspondent of the following business networks:

- WTCA Online : the network containing trade opportunities and export information from 300 WTCs
- Trade Point : a network of 100 commercial centres launched by the United Nations
- European Community : all tender offers from the EC
- Technology, Innovation & Information (TII): a Europe-wide network for technology-based companies seeking partners.

Montpellier also enjoys privileged relations with the following countries:

- Australia : Economic cooperation between Montpellier and Adelaide, capital of the State of South Australia, since 1989 has resulted in a convention being signed in 1996 between GEMLR (the Languedoc-Roussillon group of multimedia companies) and AIMIA (Australian Interactive Multimedia Industry Association).
- Great Britain : Montpellier Méditerranée Technopole is currently developing relations with St. John's Innovation Centre in Cambridge. Montpellier is also represented by a permanent consultant based in Leatherhead, south west of London : Prowse & Co.
- USA : The cities of Montpellier and Louisville have been twinned since 1955. WTC Montpellier Méditerranée Technopole is in touch with World Trade Center Kentucky, building commercial relationships between the two cities. Montpellier is also represented in the USA by a permanent consultant in Chicago : Alma Bridge.
- Spain : The partnership launched in 1963 with Barcelona has grown within the framework of the C6 Network which brings together the cities of Toulouse, Palma de Majorca, Valencia, Zaragossa and Montpellier. The C6 Network encourages links and exchanges in the fields of tourism, culture, transport and the environment.
- Germany : Montpellier is twinned with Heidelberg in the Bade-Wurtemberg.
- China : Montpellier has been twinned with Cheng-Du since 1981 - the first Franco-Chinese twinning operation. Conventions have been signed with Paul Valéry University. Collaborations have also been successful in various technical fields such as urbanism and architecture and economic fields with participations in exhibitions and investment projects.

A number of companies established in the Montpellier Technopole have indicated Australia as a target for business growth:

- BIOPHYDERM
- CONTRALCO
- JEAN DE BRU SA
- PPB INTERNATIONAL
- TECHNOLOGIES VITICOLES RICHTER S.A.

In addition to meeting with representatives of these companies, it may be appropriate to discuss the potential for St Andrews to participate in the World Trade Centers collaboration.

Annex 1: Outline of Montpellier Poles

HEALTHCARE – Euromedicine Park

This 'centre of excellence' is based around:

- A network of world-class medical and pharmaceutical companies: research laboratories including Sanofi Research, Chauvin and Arkopharma
- Manufacturing companies like ABX (automated haematology analysers), Labover (laboratory equipment and scientific instruments), Institut Pourquier (veterinary immuno-diagnostics), DMS (ultrasound equipment), SMI (intelligent autoclaves) and a number of companies grouped together under the name GiMed (Groupement des Industries Médicales)
- Europe's oldest Faculty of Medicine (founded in 1220) and France's 4th largest teaching hospital, with their teams of researchers working in macromolecular biology, genetics, the nervous system, medical imaging, cancer prevention and treatment, immunology, asthma, cochlea transplants, neuroscience, biopolymers and biomaterials, sleep disorders, nutrition and biotechnology

The centre of this Pole is the Euromedicine Park which covers 150 ha. Four main styles of properties are available to attract enterprises:

- Mini-Park, an office and lab complex for medium term occupancy by rental.
- Les Athamentes, multi-use office space for sale.
- District Standby Workshops, for short term rental and incubation.
- Vacant land for sale for the construction of purpose built accommodation.

AGRICULTURAL SCIENCE – Agropolis Science Park

Montpellier has one of the world's highest concentrations of research into tropical and Mediterranean agriculture. Over 2,000 research scientists and academics work in some 20 research laboratories, including CIRAD, INRA, ORSTOM, CSIRO, ARS-USDA, ENGREF, IAM and CNRS.

This concentration of research is an important international vector in north-south cooperation. It can claim world leadership in key sectors, including tropical in vitro cultivation, biological controls, nuclear resonance analysis, genetic resources, fertilisers and crop protection, processing of tropical foodstuffs, food and nutrition, and tropical epidemiology.

The region is also home to major manufacturing and processing companies: PERRIER (carbonated spring water), CANTALOU (chocolate) KRAFT-JACOBS-SUCHARD (coffees), SALINS DU MIDI (wine and salt production), BCEOM (irrigation and land management), BLANQUETTE DE LIMOUX (sparkling wines), ROYAL CANIN (pet foods) ...

INFORMATION TECHNOLOGY – Communicatiqu Pole

This unique business park has been built up over the last 30 years, centred on IBM's manufacturing plant. It was initially intended for large-scale production of mainframe computers and associated equipment. More recently, in line with Montpellier Technopole's strategy, it also houses smaller, technology-based businesses.

The University Computing Centre (CNUSC) is connected to international networks such as EARN, EASInet, NSFnet, SPAN. It has the second most powerful supercomputer in France, which is available for both private and public sector research programmes.

The centre of excellence incorporates several major academic and research organisations, including EMA (the Alès school of mining engineering), ISIM (the Montpellier Institute of Science and Engineering) and LIRMM (the Montpellier Laboratory of Robotics and Microelectronics).

Private sector companies linked to this centre of excellence include DELL Computer, EVI-TOSHIBA (vacuum switches), PIXTECH (flat screens), CAP GEMINI EXA (software for banking systems), GEC-ALSTHOM (power supplies equipment).

An industrial park, Millenaire, has been established to cater specifically for software and hardware development. IBM claim that the per capita productivity is greater here than in any other of its 48 manufacturing facilities in 17 countries.

'ANTENNA' - MULTIMEDIA AND TELECOMMUNICATIONS

This centre of excellence specialises in multimedia, electronic imaging and telecommunications. It belongs to several European and international networks including 15 TV channels, many radio channels, a tele-video library and a regional education link between schools.

This pole is unlike the others as it does not rely on the synergistic relationships between public and private R&D and associated enterprises but on the modern development of the fibre optic cable system.

The CFPJ (School of Journalism) and l'IDATE (European Audio-visual and Telecommunications Institute) are located at this pole.

GEM-LR is a group of multimedia businesses based in the region. The Mediterranean Film Festival is an opportunity each autumn for audiovisual specialists from all around the Mediterranean to meet in Montpellier.

The Grammont International Film and Video Centre is located in this pole. It accommodates permanent and temporary film projects with professional staff and all the infrastructure required to assure competent technical support is available for all phases of film production. Two offshoots of this Centre are:

- The Videothèque – a modular area capable of being adapted for groups of between 20 to 400 people to show local productions or collect works from the technopole; and
- Dicacothèque – which offers the latest computer generated and video productions.

'HELIOPOLIS' - THE ARTS, TOURISM AND LEISURE

This pole is based on the concept of combining the natural and scenic beauty of this seaside setting with the tourism and convention industries. Education of hospitality industry staff is carried out at the International Centre for Tourism Development (CIAT).

Le CORUM, the city's convention centre and opera, provides a capacity of 300,000 delegate-days per year, making Montpellier France's third city for conventions. The ZENITH provides a further 6,000 seats for concerts and shows.

The Radio-France Music Festival, the Montpellier Dance Festival and the Mediterranean Film Festival are all well-known internationally. AIR LITTORAL serves many European destinations from its base in Montpellier.

The vast Port Marianne project is a 350-berth marina, designed by international architects such as Bofill, Portzamparc, Vasconi, Chemetov, Meier, Fainsilber, Krier, Huidobro. It provides the capital city of the Languedoc-Roussillon Region with a permanent waterway link to the Mediterranean.

SOPHIA ANTIPOLIS PROFILE

Project Name: Sophia Antipolis, France

Descriptive title: Sophia Antipolis is an international business/science park near Nice on the Cote d'Azur. It was initiated in 1969 and now houses more than 1,000 enterprises, over 17,000 engineers and technicians and 5,000 researchers. Over 2,000 families live in Sophia Antipolis and 40% of its residents work in the Park.

Abstract

Sophia Antipolis Science Park is a successful residential and technology park. Sophia Antipolis covers 2,300 hectares and is planned to eventually cover more than 4,600 ha with the addition of land to its north.

Its main activities are R&D in technology, science and commercial services. An extensive telecommunications system and access to local airport and motorway connections support networking with the rest of Europe. Industries represented include:

- Information Technology
- Life Sciences
- Energy, Environment and Engineered Materials
- Universities and Research
- Manufacturing and Services
- Professional Corporations
- Retail Trades, Personal and Commercial Services

The quality of life has been a priority ever since the Park opened. Two-thirds of the Park – 1,500 ha - has been set-aside for green space. Strict building codes guide development. Priority is given to innovative design and integration of buildings within the site. This strict respect for the environment has given the entire development a very high quality.

150 ha of the 800 ha set aside for building have been reserved for housing, sports, and recreation. Over 2,000 families or more than 6,000 people live at Sophia Antipolis, and 40% of them work there. Most of those working in Sophia Antipolis live within a 12-mile radius, and a 30-minute drive of the Park. 40 tennis courts, 4 golf courses, and many other sports complexes serve the Sophia Antipolis area. There are 8 hotels offering 750 rooms, and complete conference facilities.

Residents and employers claim an average 30% increase in productivity after moving to the technopolis.

Key Stakeholders

Sophia Antipolis was the brainchild of Pierre Laffitte, then the Deputy Director of the Ecole Nationale Supérieure des Mines de Paris. "Why not set up a "Quartier Latin" in the country?" was the focus of a 1960 Le Monde article written by Laffitte.

Laffitte had a vision for a city of science, culture and wisdom, to be created on the plateau of Valbonne – the only significant developable site on the Cote d’Azur, which up to then had lacked access and basic services.

The initial plan was to develop 47 ha, however, in 1972 an Interministerial Land Development Committee declared the project to be in the national interest and allotted it 2,300 ha.

In 1972 the first institutions located on the site, among them Laffitte’s Ecole Nationale Superieure des Mines de Paris, which was claimed to play a critical role in the success of the project.

During much of the 1970’s progress and development at Sophia Antipolis was slow. It was seen as a ‘high-technology’ island, divorced from the rest of the region. Although it was of national importance, and had an Interministerial group to coordinate activities, it did not have specific government backing. DATAR, the French national agency for regional planning and development was in favour of the project but other ministries were reserved, if not hostile, and funding for the project dried up at one stage.

Locally, a syndicate ‘Symival’, was set up in 1975 to represent all five local communes, the DATAR and the local chamber of commerce and industry and it began to develop the infrastructure and to delegate powers of commercial development.

In 1977 the public sector became more involved and the Park’s development sped up. At this time a semi-public company was created to try and draw foreign investment outside the Paris area. Almost simultaneously, Air France bought its world-wide passenger reservations service to the Park, as it was reassured by the presence of IBM and Texas Instruments. These enterprises also attracted Digital.

Between 1977 and 1981 the Park grew rapidly. Investment rose sevenfold between 1982 and 1989. The project was and still is financed by the sale of land with 70% of revenue from this source.

Statement of Achievements

1. Achievements delivered by the project or activity in relation to the IDEA Project concept areas of:

Innovation – type, extent, success, method, etc.

There have been several extended academic evaluations of Sophia Antipolis³. All reach somewhat pessimistic conclusions, somewhat in variance with the media or public relations output of the Park and the region.

³ Perrin, J. (1986) ‘La Phenomene Sophia-Antipolis dans son environnement regional’ in Aydalot P (ed) *Milieux Innovateurs en Europe*: 283-302, Paris GREMI; Perrin, J. (1986) Les P.M.E. de HT a Valbonne Sophia Antipolis’, *Revue d’Economie Regionale et Urbaine*, 9. 629-43; Quere, M. (1990) *Sophia-Antipolis dans le Contexte Francais*, Paris, GIP ‘Mutations Industrielles.

Perrin found Sophia Antipolis has a dual structure: (a) as a prestige address for established trans-nationals; and (b) as an incubator for basic research and in management. Each structure is very different in its functions. The first attracts established firms by imitation, reinforcement and image and has created the majority of the jobs at Sophia Antipolis.

The second depends on 'collective apprenticeship' through communications and through launching new products. In Perrin's view it had not been very successful in generating a critical mass of new SME's.

Perrin posits that the dual structure may have inhibited the necessary cross-fertilisation – both vertically between R&D and production – and horizontally between sectors. He argues that regionally, within the Cote d'Azur, the high-tech industrial tissue is weakly developed: there is a weak system of sub-contracting; costs for land, maintenance and qualified labour are too high; there is a lack of technological (testing labs, etc) and organisational (risk capital, marketing, etc) services. Also the large firms provide generous pay and facilities for their researchers so they are not often inclined to leave and start spin-off companies.

Quere notes that Sophia Antipolis and the development surrounding the city of Grenoble is the only true example of successful technological development in France. He posits, however, that it lacks an innovative milieu for three main reasons:

- Sophia Antipolis consists of three poles – IT, Biotech and Energy and the firms in the milieu possess expertise in distinctly different sectors which does not favour partnerships or the development of cross-cutting activities.
- There is an isolation of the human resources. An analysis of the labour market shows there is virtually none of the mobility between firms that is characteristic of Silicon Valley.
- Firms and research centres see an actual danger in cooperation: proximity plays a negative role in innovation.

Admittedly, Sophia Antipolis is a success at one level because it has worked at the development and packaging level: the Park is developed and it has attracted many enterprises and jobs. But it is considered by some academics not to work at a deeper and, in their opinion, a more critical level which is the creation of a true milieu of innovation as they feel the necessary synergies are not yet richly developed.

Development - in a sustainable manner

The importance of the environment has been a crucial component of planning for Sophia Antipolis since its inception. 1,500 ha - 2/3 of the Park- of forested Mediterranean growth surrounds the Park and forms the Sophia Antipolis " Green Belt ". This belt of vegetation is broken up into parks for development which have open access to the public. 150 ha are devoted to sports and leisure activities : tennis clubs, golf courses. 720 ha are available for development. The land use ratio is 30%. And only 10% of the 2,300 ha are paved or constructed on.

No towers are allowed in the development. All buildings have to be integrated into the landscape and cannot rise above the hills around the Park. Strict building codes guide development standards.

Employment - knowledge based employment outcomes, growth projections

Since its commencement, on-site employment has grown to more than 17,000 engineers and technicians and more than 5,000 researchers. These people are employed in over 1,050 companies.

Classification of company size at 1996:

- 24 companies employing more than 100 persons that represent 2,4% of the companies located in the Park.
- 32 companies employing 50 to 100 persons that represent 3,2% of the companies located in the Park.
- 210 companies with 10 to 50 persons that represent 21% of the companies located in the Park.
- 734 companies with less than 10 persons, that represent 73,4% of the companies located in the Park.

Classification of employment type at 1996:

1. Information Sciences, Electronics, Advanced Telecommunications

- 238 corporations and 6,229 employees
- 22% of the corporations and 38% of the work force.

2. Health Sciences, Chemistry, Biotechnologies

- 58 corporations and 1,927 employees.
- 5% of the corporations and 13% of the work force.

3. Environment, Energy

- 19 corporations and 286 employees.
- 2% of the corporations and 2% of the work force.

4. Universities and Research Institutions

- 60 establishments and 1,971 employees
- 7% of the corporations and 13% of the work force.
- 2 600 students and 3 400 pupils of the primary and secondary cycles.

It is claimed the existence of Sophia Antipolis has been directly responsible for the creation of over 30,000 jobs in the local region and that more than 100,000 jobs (over 10% of the entire workforce) of the region are connected in one way or another with the Park.

Application – including the degree to which spin-offs occurred and the extent of any emulation of the project or activity by others

In the 1980s certain multinationals – IBM, TI, Digital Equipment, Rockwell International, Cird Galderma, Wellcome, Allergan, AT&T - chose Sophia Antipolis to set up research and production facilities, as well as French and European Headquarters. The presence of these trans-nationals continues to attract new business and research centers.

Employment growth came close to eighteen percent on the site in 1989. In spite of the recession and international upheavals wracking western economies since the early 90s, Sophia Antipolis has continued to generate a positive balance sheet in employment and business start-ups. Much of this is due to the vitality of small businesses.

Executives and researchers have set up enterprises such as Access Privilege, Espri Concept, Simulog, Istar, MXM, and are positioning their companies for very specialized market niches. These initiatives are being reinforced by the arrival of new foreign businesses - mostly American - who are coming up with new products for the European market.

Notwithstanding the research of Perrin and Quere, more recent documents from Sophia Antipolis claim that there have been significant spin-offs from the main R&D centres. Enerscop, Cristopia, Sigma Consultants, Sophiatec and others stem directly from Telemecanique, from the Ecole des Mines, INRIA, the University or other major organisations in the Park. Since the late 1980's there have been 3rd generation companies which had their origin in companies established several years earlier by persons working in the R&D centres.

2. Achievements related to the attraction of enterprises and clusters of enterprises, and investment attraction.

The semi-public incorporated *Sophia Antipolis S.A.E.M.* was co-founded by the Departement of Maritime Alps (the regional council) and the Chamber of Commerce for Nice and the French Riviera to assume the role of operator of the science park. It does this in conjunction with SYMIVAL, the Operation's supervisory body which is a mixed syndicate composed of the various communes upon which the Park is located, the Chamber of Commerce, the Departement and the Chamber of Agriculture.

Sophia Antipolis S.A.E.M. is responsible for the Park's:

- *Development:* prospective studies which influence the Park's development at an economic level (poles of excellence, targets, etc) and at a logistical level (infrastructure requirements and expansion of the Park); pre-operational studies regarding space requirements for enterprises; and construction works throughout the Park.
- *Management:* In association with the communes, the Company handles the management of the Park including static and dynamic traffic signals, transport, and day-to-day operations.
- *Marketing:* This is concerned with pursuing negotiations with companies or potential investors (in line with the norms of quality that have already been defined for the site's development) and offering new arrivals logistical support.
- *Promotion and communications activities:* Communications is carried out at 2 levels. Firstly, within the Science Park itself to inform 'Sophipolitans' and on-site companies of current events and developments within the Park, and, secondly in the outside world, to promote the Park both in France but more especially abroad, by working in collaboration with specialised partners, at local, national and international level DATAR offices throughout the world.

In Sophia Antipolis, public higher education and research is built around the needs of business. Children ranging from 10-18 years from 73 countries study an international curriculum in the schools of Sophia Antipolis. 2,500 students and 4,000 public and private researchers carry out their work at the Science Park.

The high level of skills, the international renown of the research teams, and the performance of the businesses themselves has led to the establishment of centres of expertise. These centres have developed very specific training programs that are unique in their class. *Eurecom* is an example in information technology, and the *Magisterium of Pharmacology* in life sciences.

Sophia Antipolis claims to be the 'exception to the rule': Public research and university teaching have traditionally been the parents of science parks. Sophia Antipolis bucks this trend as the University was barely started in Nice in 1965. It grew apace with the Science Park.

For investment attraction, the banking potential is stimulated by the proximity of Monaco and this is considered to be a real advantage.

Alliances Achieved

A number of associations have been created in the past two years to develop and promote their particular sector of activities: Telecom Valley, MITSA, IMeT, EUROSUD, ISS, DATABASE FORUM, PERSAN.

Other organisations such as the 'Club of Directors' concern themselves directly with the growth of infrastructures provided for business development. Scientific and cultural life is an essential element in the dynamism of Sophia Antipolis. The Sophia Antipolis Foundation regularly organises concerts, expositions, and business breakfasts for business leaders, researchers, and scientists to get together and push forward their projects.

Possible alliance partners for St Andrews could include Sophia Antipolis S.A.E.M., the management organisation for the Park.

ANNEX B - GENERIC QUESTIONS PERTAINING TO PROJECTS VISITED

To facilitate interaction between the members of the IDEA Project World Study Tour and the various representatives of the projects visited, a set of *generic* questions were formulated and provided in the IDEA Project World Study Tour Workbook.

These questions provided a framework for general face-to-face discussions. It was not intended that the answers be formally recorded as the results of the discussion are synthesised in the preceding sections of this Study Report.

1. Generic questions on financing/investment chronology for the project as a whole and in relation to planned outcomes.

1. To what extent was funding provided by the public sector and the private sector during:
 - Concept development of the Project
 - Project start-up
 - Project implementation?
2. If public sector funding was provided, which agency/agencies contributed to the Project?
3. What form(s) of assistance did the public sector provide:
 - Grants, subsidies, loans, tax policy or regulations?
4. If private sector funding was provided, which enterprise/enterprises contributed to the Project?
5. In addition to equity funding, to what extent was debt funding used to develop the Project?
6. Did the Project utilise:
 - Innovative private sector funding including Build/Own/Operate/Transfer, franchising, concessions, public enterprise, technical assistance, vouchers, impact fees or negotiation; and
 - Avant-garde private sector funding including seed money, equity investment, quid pro quos, and sale, exchange or use of property?
7. What was the main factor influencing the first major employment generator to locate in the Project?
8. What incentives, if any, were provided to the initial employment generators that located in the Project?
9. What was the chronology of investment for the Project?
10. With hindsight, would the management try to attract investment differently now?

2. Generic questions on I-D-E-A achievements

Innovation – type, extent, success, method, etc.

1. To what extent is innovation a driving principal for the Project?
2. Have innovative means been developed and used to formulate and appraise scenarios likely to impact on the Project?
3. In what ways are existing and emerging urban designs considered to be innovative?
4. Are education, R&D and technology commercialisation significant drivers of the Project?

Development - in a sustainable manner

1. Does the Project have a set of principles for sustainable development?
2. Are their local/regional guidelines for sustainable urban development such as a *Local Agenda 21* plan of action based on the *Agenda 21* plan of action promulgated by the 1992 UN Conference on Environment and Development?
3. Has an Environmental Management System (EMS) based on the International Standardisation Organisation (ISO) 14 000 series of standards been developed for the Project? An EMS has an overarching goal of continuous environmental improvement and provides a frame for the following:
 - The range of environmental issues identified for the urban development as a fully operational entity.
 - The environmental policy context including all relevant statutory linkages, requirements and commitments.
 - The planning and design of the project so as to accommodate the integrated and incremental development of the site.
 - The implementation and operation of the project by way of actions, tasks and the resources required to achieve successful environmental management outcomes.
 - The checking and corrective actions needed including monitoring and auditing provisions, performance indicators and reporting and recording arrangements.
4. What urban design practices and technologies have been used to conserve water, energy and to reduce resource usage, re-use materials and recycle to keep wastes to an absolute minimum or zero?
5. To what extent has the Project fostered or benefited from industrial ecology or industrial symbiosis practised at any of the following levels:
 - Region-wide comprising well-defined boundaries across which the flows of materials and energy can be monitored.
 - Clusters of manufacturing enterprises or firms, consuming a range of material and energy inputs and producing flows of products, emissions and wastes in so-called eco-industrial parks.
 - Individual materials, focusing attention on the life cycles of particular elements or substances, from carbon dioxide to mercury?

Robert U. Ayres says of industrial symbiosis:

"There is a compelling analogy between biological organisms and industrial activities - indeed the whole economic system - not only because both are materials-processing systems driven by a flow of free energy, but because both are examples of self-organising, dissipative systems, in a stable state, far from thermodynamic equilibrium."

6. To what extent does the Project foster self-containment in food production through urban farm developments, orchards, vegetable gardens and allotments, and integrated combinations of the foregoing through practices such as permaculture?

Employment - knowledge based employment outcomes, growth projections

1. Have the main regional economic advantages likely to benefit the Project been identified?
2. Have the potential sizes of global, national, State and regional markets corresponding to these economic advantages been assessed, in value terms, and what are their growth prospects over the medium to long term?
3. Have possible shares of these markets that may be captured by the Project been determined?
4. Have the types and numbers of enterprises and employees required to achieve these market shares been assessed?

Application – including the degree to which spin-offs occurred and the extent of any emulation of the project or activity by others:

1. Has a Social Benefit-Cost-Analysis (SBCA) for the Project been conducted? (SBCA quantifies and qualifies the Project's impacts with respect to the net gain to the nation or region from its conduct when compared to the 'business as usual' scenario.)
2. Did the SBCA account for the potential benefits of sustainable development initiatives, capitalising on regional economic advantages and achieving attendant market shares, attracting enterprises and associated employment levels?
3. Did the SBCA account for the capacity to capture the foregoing potential benefits in terms of the regional and national governments incentives/imperatives for attracting enterprises?
4. Did the SBCA account for the spillover benefits to other regional enterprises?

3. Generic questions on enterprise attraction

1. What are the Projects principal achievements in attracting development opportunities/ options comprising enterprises, clusters of enterprises, or investment in infrastructure and facilities?

2. Has the Project established a framework for assessing the *potential benefits* of development options corresponding to regional economic advantages that focuses on:
 - Who are the potential users and customers of the enterprise, cluster of enterprises, or infrastructure/facilities and how will they benefit?
 - What parts of existing industry and/or the community will benefit?
 - How will the enterprise, enterprise-cluster or infrastructure/facility contribute to the growth of existing enterprises and increase their competitiveness?
 - Are there any other important benefits, direct and indirect - environmental (degradation avoided), social (social amenity, health, safety), employment creation?
 - Are there spillover benefits to other enterprises, enterprise-clusters or infrastructures/facilities within the Project?

3. Has the Project established a framework for assessing the *ability to capture* the potential benefits of development options that focuses on:
 - What is local industry's and/or community's commitment to the option?
 - What is community's ability to exploit the results?
 - How will the benefits of the option be captured in the community?
 - Are there potential commercial partners?
 - What are the incentives/imperatives for implementation of the option by local, regional and national governments?
 - Will the option provide a capacity to compete nationally and internationally?
 - Are there factors and conditions likely to promote or impede uptake, such as regulations, industry structure, physical conditions, ethical, cultural/social, environmental or political factors?

4. Has the Project established a framework for assessing the *appropriateness/ justification for involvement by proponents/stakeholders* in delivering development options that focuses on:
 - How relevant are the challenges of delivering the option to the mandates of proponents/stakeholders?
 - How likely are the opportunities, encompassed by the option, to make a distinctive contribution to development of the community; i.e., opportunities that complement, rather than compete with the effort of local, regional and national agencies?
 - Are the options likely to provide investors value for money?
 - Are the options likely to be integrative across important aspects of the overall program of development of the Project?

5. Has the Project established a framework for assessing the *capacity of proponents/ stakeholders to deliver* development options that focuses on:
 - Would the proponents/stakeholders be able to provide or acquire the level of skills in the time required to implement the program of activities necessary to capture the benefits from the various opportunities encompassed by the option.
 - What comparative advantages do the proponents/stakeholders have to deliver the option?
 - Could the anticipated benefits be obtained more efficiently and effectively from enterprises or enterprise-clusters external to the overall development?
 - Who are the potential collaborators/competitors?

4. Generic questions on alliances achieved

1. What alliances have been formed with:
 - Business groups or enterprises within the Project
 - Social groups within the Project
 - Business groups or enterprises outside the Project
 - Government agencies
2. Do you have any alliances with overseas Projects or groups?
3. How important are these alliances to the Project's success?
4. Have the alliances resulted in higher commercial returns to the Project?
5. What have the alliance partners received from their participation with the Project?
6. How were the alliances initiated and facilitated?
7. How have the alliances changed since the commencement of the Project?

ANNEX C - SPECIFIC QUESTIONS PERTAINING TO PROJECTS VISITED

To facilitate interaction between the members of the IDEA Project World Study Tour and the various representatives of the projects visited, a set of *project specific* questions were formulated and provided in the IDEA Project World Study Tour Workbook for a number of destinations visited.

These questions provided a framework for project specific face-to-face discussions. It was not intended that the answers be formally recorded as the results of the discussion are synthesised in the preceding sections of this Study Report.

1. THE WOODLANDS QUESTIONS BRIEF

1. At The Woodlands, what is the current number of:
 - Residents
 - Employers
 - Jobs
 - Dwellings
 - Commercial space?
2. Is the project considered a success in terms of:
 - Land and building sale returns
 - Sustainable development
 - Choice of housing diversity and price?
3. What are the reasons why The Woodlands was the only commercially successful HUD new town?
4. How frequently is the Masterplan for the Woodlands reviewed?
5. Has there been any change to the original environmental design and development philosophy of Mitchell Energy and Ian McHarg with the change in ownership?
6. How important is the affiliation with the nine major US universities and research institutions to the Research Forest?
7. To what degree is there interaction between the enterprises within The Woodlands?
8. Has there been a change in the type of industries being attracted to The Woodlands over time?
9. How does the price of land in The Woodlands compare to Houston and Dallas?
10. What are the main competitors, if any, to The Woodlands in terms of alternative business locations?
11. Is The Woodlands targeting any particular industry sectors?

2. CAMBRIDGE QUESTIONS BRIEF

1. Given that the proposed *City of Anglia* would eventually span an area and have a population density comparable to Canberra, is it likely to grow to a population of 250,000–300,000 characterised by low density suburban sprawl or to comprise a large number of distinct but well connected towns and urban villages?
2. Is a neighbouring city or new town larger than Cambridge the most likely option to gain approval?
3. How likely are a neighbouring new town/city **and** a *City of Anglia* outcome?
4. How many developments like Cambourne are on the ‘drawing board’ in the Cambridge region?
5. What combinations of the seven basic options is the Cambridge Futures project planning to assess?
6. Will the combinations encompass appraisals of 1-3 above?
7. Does the appraisal methods of the *Cambridge Futures* project draw on:
 - Regional input-output analyses extended to account for natural resource capacities?
 - Potential for fostering industrial symbiosis at enterprise cluster, local and regional scales?
 - Computerised simulations of optimal locations of intra-Project and linking intra-regional infrastructure?
 - Social Benefit Cost Analysis integrating the findings of the foregoing?

3. KALUNDBORG QUESTIONS BRIEF

1. How active is the Kalundborg Symbiosis Institute in developing a global network of industrial symbiosis projects?
2. What links/alliances have been established with the *eco-industrial parks* (EIPs) program funded by the US President’s Council on Sustainable Development?
3. What links/alliances have been established with other significant developments in industrial symbiosis in other parts of the world including those within the EIPs program?
4. Does the Symbiosis Institute coordinate the delivery of consultancy services from Kalundborg companies to other existing and emerging developments in industrial symbiosis around the world?
5. While there has been no attempt to optimise the economic efficiencies and the usage of natural resource among Kalundborg enterprises, to what extent has the industrial symbiosis achieved at Kalundborg stimulated international research along these lines?

6. What attempts have been made to develop engineering control models that seek to explain then suggest solutions that optimise natural resource usage among Kalundborg enterprises? If not in Denmark, elsewhere?
7. What attempts have been made to develop economic input-output and other models that seek to explain then suggest solutions that optimise natural resource usage among Kalundborg enterprises? If not in Denmark, elsewhere?
8. Are all companies developing an ISO 14001 Environmental Management System along similar lines to Novo Nordisk and publishing annual progress on the Internet?
9. Is there any attempt to determine the overall impact of implementing such individual Environmental Management Systems on the industrial symbiosis outcomes achieved at Kalundborg? For example, the intention of Novo Nordisk to source more of its power needs from Swedish hydroelectric power sources.
10. What has been the growth in visitations by fact-finding missions and in industrial tourism since the establishment of the Symbiosis Institute? Do you market the Institute on the Internet?

4. MERKUR CO-OPERATIVE BANK AND GAIA TRUST QUESTIONS BRIEF

1. What is the financial relationship between *Merkur* and *Gaia Trust*?
2. Has *Merkur* prepared assessments of the financial attractiveness of investments in portfolios of 'green' businesses compared with conventional portfolios of business investments?
3. Does *Merkur* provide equity as well as debt funding to eco-village development projects and 'green' businesses?
4. What are the lending arrangements to a group of individuals and enterprises with responsibility for an eco-village project?
5. What is the status of the proposal for the \$US100 million fund for eco-village projects to be administered through the United Nations?
6. Do you envisage that the \$100 million would be sourced from the \$US3 billion or so in the United Nations' *Global Environmental Facility* or the *Gaia Trust* or other sources or a combination of these?
7. Are their prospects for the type of support provided by Japan (through the Saitama Prefecture Government) to the **Local Initiatives Awards** of the *International Council for Local Government Environmental Initiatives* being extended to support for the *Global Eco-villages Network*?
8. How much interest is being shown in the activities of the *Global Eco-village Network* by new town and urban village developers around the world?

9. How much interest is being shown in the activities of the *Global Eco-village Network* by local governments around the world?
10. How much interest is being shown in the activities of the *Global Eco-village Network* by regional and national governments around the world?
11. Have there been attempts to emulate the activities of *Merkur* in other countries?
12. Do you see synergies of operation from the joint operation in a country of *Merkur-type* banking and *Grameen-type* banking for the poor?

5. MONTPELLIER QUESTIONS BRIEF

1. At Montpellier L. R. Technopole what are the current numbers of:
 - Residents
 - Employers
 - Jobs
 - Dwellings
 - Commercial space?
2. How did the Project initially identify and attract industries with a comparative advantage to Montpellier such as IBM?
3. How did Montpellier implement its three pronged strategy:
 - To aid and support the creation of new businesses.
 - To facilitate the introduction of new technologies into existing companies and activities.
 - To accommodate arriving companies and activities in the most favourable conditions possible.
4. Has the Town Association proved to be a successful management and administration model for the attraction of industry?
5. What organisational assistance does the Town Association provide to enterprises relocating to Montpellier?
6. Does the Town Association provide any assistance to enterprises already located in Montpellier that want to grow their business?
7. How is the 'Zero Defects' policy administered, and is it successful?
8. Are the subsidies to the incubator tenants generally worthwhile and what is the success rate of these enterprises?
9. Are the Montpellier business and technology parks commercially successful from the perspective of:
 - The Town Association as developer
 - The occupants?

10. How important is the linkage between Montpellier and the World Trade Centres?
11. What is the 'Exporters Club of Montpellier'?
12. Has the economic co-operation with Adelaide, South Australia been productive to each party?
13. A number of companies in the Montpellier Technopole have indicated Australia as a target for business growth. How can the IDEA Project assist them?

6. SOPHIA ANTIPOLIS QUESTIONS BRIEF

1. At Sophia Antipolis what are the current numbers of:
 - Residents
 - Employers
 - Jobs
 - Dwellings
 - Commercial space?
2. Growth at Sophia Antipolis was slow in the early 1970's, what was the trigger that initiated the growth in development in the late 1970's and early 1980's?
3. A number of enterprises locating in Sophia Antipolis claim increased worker productivity. Is this documented in any papers?
4. What is the relationship between the French Government, SYMIVAL (the developers), and Sophia Antipolis SAEM (the operator), and is this a successful management and administration model?
5. Sophia Antipolis is substantially funded from the sale of land, what are its other sources of revenue?
6. How does the price of land in Sophia Antipolis compare to its competitors, and who/where are they?
7. To what degree is there interaction between the enterprises and research bodies within Sophia Antipolis?
8. Is Sophia Antipolis targeting any particular industry sectors?
9. A number of academic evaluations of Sophia Antipolis suggest it has not been successful in developing as an innovative milieu, however, there have been significant spin-offs from the R&D centres. Why is there this criticism ?
10. Of the overall Sophia Antipolis operating budget, what proportion is allocated to marketing?
11. Do the internationally-based representative offices of DATAR generate substantial opportunities for Sophia Antipolis?

ANNEX D - CONSOLIDATED BIBLIOGRAPHY OF KEY PUBLICATIONS AND INFORMATION SOURCES

A consolidated bibliography of key publications and information sources for the various IDEA Project World Study Tour destinations is set out below for ease of reference.

D.1 ICF – Kaiser, San Francisco, USA

Key Publications

See <http://www.icfconsulting.com/icfconsulting/home.nsf/pages/ecoindex.htm>

D.2 Collaborative Economics, San Francisco, USA

Key Publications

See http://www.coecon.com/meet_cei.htm

D.3 Calthorpe Associates

Key Publications

See <http://www.calthorpe.com/>

D.4 Cambridge Futures, Cambridge, UK

Key Publications

Cambridge Futures, University Press, Cambridge, 1999. ISBN 0 9535530 00

Cambridge Futures Survey Report, Revised October 1999, Cambridge Futures, Cambridge Architectural Research, and Cambridge Media Lab.

MENTOR and MENCAM Model of the Cambridge Sub-region, Version 2.1, September 1999, Marcial Echenique & Partners Ltd

Cambridge Futures, Exhibition: Options for the Future of the Cambridge Region, Form for “Public to Voice their Views”.

See also <http://www.meap.co.uk> and <http://www.arct.cam.ac.uk/cambfut>

D.5 Mill Creek, Seattle, USA

Key Publications

See <http://www.northshorecc.org/ncc/millcreek/economy.asp>

D.6 North West Landing, Tacoma, USA

Key Publications

See <http://www.nwlanding.com/general.html>

D.7 The Woodlands, USA

Key Publications

A Brief History of The Woodlands, The Woodlands Operating Company, LP

Detailed Plan of The Woodlands, The Woodlands Operating Company, LP

Brochures on various buildings including the Ventures Technology Center, Waterway Plaza, the Town Center, The Woodlands Operating Company, LP

Marketing material for The Woodlands as a place to live, work and recreate, The Woodlands Operating Company, LP

See <http://www.thewoodlandsusa.com/>

D.8 Peterborough, UK

Key Publications

Peterborough, The Greater Peterborough Partnership.

Greater Peterborough Investment Agency, Greater Peterborough, 1999.

Profile, An update publication of the Greater Peterborough Investment Agency, issued quarterly.

See <http://www.peterborough.net/gpia/index.htm>

D.9 Cambridge New Town Corporation

Key Publications

See <http://www.c2.org.uk>

D.10 Cambourne Business Park

Key Publications

Cambourne Business Park, A New Dimension for a New Generation, Cambridge, May 1999.
A development by Development Securities and Wrenbridge.

Development Securities PLC: Optimising Value in Property.

Development Securities PLC, Interim Report, 1999

See <http://www.cambourne.co.uk>

D.11 The Merkur Bank and Gaia Trust, Denmark

Key Publications

Merkur Bank

Merkur giver dig mere end rente, brochure in Danish on services provided by Merkur Bank.

Merkur Annual Report, 1998. (in Danish).

Sociale Penge, Quarterly publication in Danish on projects funded by Merkur Bank.

English: <http://www.inaise.org/INAISE/Members/Profiles/merkur.htm>

English: <http://www.gaia.org/ecovillages/denmark/merkur/index.html>

Danish: <http://www.merkurbank.dk>

Gaia Trust and the Global Eco-Village Network

The Earth is Our Habitat, A proposal for a Support Programme for Eco-Habitats As Living Examples of Agenda 21 Planning, Gaia Trust and the Global Eco-Village Network, June 1996.

The GEN Annual Report, 1997.

Global Eco-village Network, brochure contact form.

D.12 Kalundborg, Denmark

Key Publications

Industrial Symbiosis, Exchange of resources, Symbiosis-partners, June 1999.

Asnæs Power Station, SK Power Company, Denmark, July 1999.

Statoils Raffinaderi I Kalundborg, Grønt Regnskab for 1998, May 1999.

See <http://www.symbiosis.dk>

D.13 Sophia Antipolis, France

Key Publications

Horizon 2030, SAEM Sophia Antipolis, Special Edition, June 1999

Official Guide to Sophia Antipolis, SAEM Sophia Antipolis, Number 12, 1999

Ten Good Reasons for Choosing Sophia Antipolis, SAEM Sophia Antipolis

Sophia Antipolis: A Unique path for telecommunications, TELECOM 99, Geneva, October 1999

See <http://www.saem-sophia-antipolis.fr>

D.14 Kansai Science City, Japan

Key Publications

Kansai Science City, Vol. 1 Guide to Kansai Science City, Kansai Research Institute, 1994.

Kansai Science City Challenging the Future...The New Cultural Capital, Keihanna, Foundation Kansai Research Institute.

Nara Institute of Science and Technology, Guide to Graduate Programs and Facilities 1999-2000.

Nara Institute of Science and Technology, '99 Guide Book.

Research Institute of Innovation Technology for the Earth.

Sekisui House Ltd, Comprehensive Housing R&D Institute, Guide Book.

Advanced Telecommunications Research Institute International, June 1999.

Advanced Telecommunications Research Institute International, 12-page presentation of overheads by Yasuyoshi Sakai, Executive Vice-President, Research, 1999.

Kyoto Research Park, "Your Gateway to Asia".

D.15 Tama Garden City, Japan

Key Publications

Tama Garden City Outline Brochure, Tokyu Corporation, March 1998

Welcome to Tokyu Cable Television, Tokyu Cable, November 1999

Large scale colour plan of Tama Garden City

See <http://www.tokyu-group.co.jp/tg/outline/eprofile.html>

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