

Invitation for Expressions of Interest
For
Christchurch District Energy System

Issued by:
Christchurch City Holdings Ltd.

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1. Executive Summary

This invitation for Expressions of Interest (EoI) is being issued by Christchurch City Holdings Ltd (CCHL). CCHL is the commercial and investment arm of Christchurch City Council (CCC), and is a wholly-owned subsidiary of it.

1.1 Background to a Christchurch District Energy System (DES)

Christchurch is New Zealand's second-largest city and the principal population centre of the South Island. It has a population of approximately 350,000 and a pre-earthquake GDP of approximately NZ\$11 billion. Between September 2010 and February 2011 the city was extensively damaged by a series of severe earthquakes. These led to widespread property damage and significant loss of life. New Zealand is committed to the recovery of Christchurch. Rebuilding the city will require investment of approximately NZ\$40 billion.

The rebuilding and redevelopment of central Christchurch presents an opportunity to reconsider the way that heating and cooling energy is generated and delivered to customers in the Central City.

A number of large civic buildings are to be rebuilt. These offer significant potential demand for the DES. These high-visibility initiatives, known as "Anchor Projects", are described in the Christchurch Central Recovery Plan. Funding mechanisms for the Anchor Projects were announced on June 27th 2013.

DES' are typically designed to meet the requirements of the particular environment they serve. A Christchurch DES should deliver:

- Lower energy costs, greater energy efficiency and improved energy resiliency for customers compared to stand-alone solutions;
- Greater utilization of existing energy infrastructure assets;
- Energy supply on an environmentally-friendly basis, supporting the vision for Christchurch as a 21st century clean green and sustainable city; and
- Acceptable financial returns and cash flow profile assuming attractive (to the customer) pricing and realistic investment and running cost inputs.

DES' are not common in New Zealand but they are used extensively in other countries. It is estimated that there are over 2,500 district energy systems in the United States alone. In Denmark more than 60% of heating and cooling demand is met through district systems. The only NZ DES of any size is the Dunedin Energy Centre.

The Christchurch DES needs to take account of the following specific considerations:

Positives:

- Highly visible and strongly-growing demand for heating and cooling energy as Anchor Projects and other new facilities are completed;
- High-quality and financially secure blue-chip client base;

- Existing low-cost heat-generation capacity at the Christchurch city hospital;
- The Canterbury aquifer as a localized source of latent energy for both heating and cooling;
- A high proportion of new buildings in the Central City giving a high ratio of new installations/refits;
- Potential to co-ordinate, and cost-share, pipe-laying with the Stronger Christchurch Infrastructure Rebuild Team (SCIRT). SCIRT is a construction alliance that is managing the repair of horizontal infrastructure in the city; and
- Desire to increase the city's use of renewable fuels and reduce the carbon footprint of Central City energy users.

Challenges:

- Moderate demand due to temperate climate, and a low energy-density rebuilt central city;
- Potential for conflict between sustainability and economic drivers (renewable fuels are generally more expensive than non-renewable fuels);
- Limited sources of waste or free heat from energy or power generation; and
- The high proportion of new builds in the customer base means that forecasting energy use may be challenging.

1.2 Energy Use in Christchurch

The majority of South Island electricity supply is currently from renewable sources. Other fuels used for heating and cooling in the city are: wood, coal, diesel, landfill gas (by CCC only) and LPG.

1.3 Feasibility Studies and System Design

The Christchurch Agency for Energy (CAfE) commissioned a number of early-stage feasibility studies in late 2011/early 2012.

Responsibility for the DES initiative passed to CCHL in mid 2012. The system is being supported by the Energy Efficiency and Conservation Authority (EECA).

CCHL has identified a number of areas in which the DES proposed by CAfE can be enhanced and optimised:

- **A broader product offer.** Central city DES customers need heating and cooling. Early feasibility studies had considered cooling, but had not developed a concept for its delivery.
- **Improved environmental profile.** Early-stage analysis assumed the use of central city DES boilers (for heat supply) located close to the point of energy consumption. Close proximity is important to minimize pipeline costs and network energy losses. Even using biomass fuels, this proposal would have some adverse environmental outcomes (because of air quality considerations, transport and fuel handling issues). CCHL has worked with the engineering community to propose an alternative for energy supply with an improved environmental profile.

- **Stronger financial returns.** The system, as proposed at the feasibility stage, offered low returns and negative cashflows for the first several years. Moving from a networked system for the entire central city to a series of discrete hubs (which could be connected later) reduces early-year investment costs and boosts returns.

CCHL's analysis suggests that a viable Christchurch DES would have a number of discrete energy supply hubs. Each hub would be anchored by a small number of large, blue-chip, customers. Broadly-speaking there would be two types of hub: (i) Heat-only; and (ii) Heat and Cool. Each hub would be specifically designed around the energy needs of its core customers:

- **Hub-Type 1 - Heat-Only Hub.** An opportunity exists to create a single heat-hub at the south-west corner of the CBD. This small-scale heat-only network would be powered - at least initially - by the existing hospital boilerhouse. Attractive revenue growth rates would be underwritten by increased demand from its three strong and stable anchor clients (the Hospital, the Health Precinct and the Metro-Sports Facility). The CDHB is interested in maximizing the value of its boilerhouse assets. Working in close cooperation with CCHL, the CDHB intends that this EoI will inform its decision-making process in relation to this opportunity.
- **Hub-Type 2 – Heat/Cool Hubs.** Several of these hubs could be created across the Central City. This component of the system uses constant-temperature aquifer water as an energy source for water-driven heat pumps. These heat pumps provide both heating and cooling without the need for combustion of fuels. This component of the system is attractive as it is renewable and offers substantial energy savings. A number of abstraction/reinjection wells would be required for a system of this size. This fits with a phased build-out. This technology is already in use at the Christchurch and Dunedin Airports.

1.4 Purpose of this Invitation for Expressions of Interest

The purpose of this EoI is to:

- Seek responses from private-sector organisations (individual firms and/or consortia) that are interested in and qualified to participate in the development of a Christchurch DES.
- Gain a clear understanding of the private-sector capacity and capability available in the market. This should include the private-sector's willingness to design, build, finance and operate such a system.
- Encourage innovation and explore other alternatives for the design of the Christchurch DES.

Responses will be evaluated by CCHL and its partners and will be used to inform the next steps of delivery of the Christchurch DES.

1.5 Respondents to this EoI:

- Should feel able to challenge the proposed design options for the Christchurch DES contained in this document, and provide viable alternatives if appropriate.

- Should address the entire system (i.e. both the single heat-only hub and the multiple heat & cool hubs).
- Can be individual firms or consortia.
- Can be international or domestic organisations.

1.6 Procurement Methodology

The procurement methodology for the Christchurch DES has not yet been decided. At this stage, the following approaches will be considered:

- Design & Build
- Design, Build & Finance
- Design, Build, Finance & Operate/Maintain

All other things being equal, respondents that offer a complete solution will be favoured over respondents that do not.

Following the closing date, credible respondents will be invited to participate in further discussions regarding their EoI responses and any additional points of interest to CCHL and its partners.

Only those parties that respond to this EoI invitation will be considered when determining which firms will be invited to participate in the subsequent procurement process. Changes to consortium members after submission date may, however, be considered with the written approval of CCHL.

1.7 CCHL Role

This EoI is being issued by CCHL. CCHL is responsible for managing the Council's investment in eight fully or partially-owned trading companies – Orion New Zealand Ltd, Christchurch International Airport Ltd, Lyttelton Port Company Ltd, Enable Services Ltd, City Care Ltd, Red Bus Ltd, EcoCentral Ltd, and Selwyn Plantation Board Ltd. CCHL subsidiaries own a significant portion of Christchurch's strategic infrastructure.

CCHL has taken the initiative to seek expressions of interest for a DES in a facilitative role given the interest expressed during the planning for the city rebuild. No commitment has been made at this stage for direct investment by CCHL. CCHL anticipates that other organizations such as the CCC, the CCDU (Central Christchurch Development Unit), the CDHB, and the Energy Efficiency and Conservation Authority (EECA) will be involved, as appropriate, in evaluating EoI responses. The final decision on all matters relating to the hospital boilerhouse rests exclusively with the CDHB.

1.8 Evaluation Criteria for EoI Responses

In evaluating EoI responses, CCHL and other parties involved in the process will pay particular attention to the following functional requirements:

- Proposals that offer tangible benefits for the City of Christchurch through energy delivery to customers that is low-cost, reliable and resilient;
- Proposals that have sound environmental credentials (reduced carbon footprint, benign to/protective of the aquifer, sensitive to air quality issues);

- A proposal for the single Heat Hub that offers an attractive risk-adjusted financial outcome for the CDHB;
- Proposals that are practical, where plans are in place to manage risks, and which can be delivered in time for connection to major clients;
- The skill base and relevant track record of respondents;
- Proposals with limited 3rd-party dependencies;
- The willingness of respondents to finance their proposals, and the expected sources of that finance;
- The expected commercial and financial viability of the proposed system;
- Respondents' experience of operating in the Christchurch environment;
- Proposals where risks, and strategies for their management, are clearly identified; and
- The existence (and management) of any real or perceived conflicts of interest.

These evaluation criteria are only a guide and CCHL reserves the right to depart from these criteria in the evaluation of responses. The evaluation criteria are not in any particular order and will not necessarily be accorded equal weight.

1.9 Timeline

The following table contains estimated key dates. CCHL reserves the right to change any dates provided.

Event	Indicative Date
Issue of EoI:	11 July 2013
Questions to CCHL, in writing, by:	1 August 2013
Answers posted on GETS:	8 August 2013
You must respond to this EoI by:	29 August 2013

2. Central City DES Demand & Energy Pricing

2.1 56MW of Blue-Chip Client Demand in 4 Discrete Hubs

CCHL has identified around 56MW of blue-chip Central City heating and cooling demand. This book of demand has been compiled from a defined list of projects, all with strongly creditworthy end-clients. Much of this demand flows from the proposed Anchor Projects that were identified in the Christchurch Central Recovery Plan and which are of strategic value to the city's rebuild. Many of these projects are public-sector and have government-type credit ratings.

39MW of heat demand, 17MW of cooling demand. Within this identified segment of the Christchurch energy market, heat demand is likely to exceed cooling demand by a factor of around 2:1. This is because of the high heat demands of the hospital and the Metro-Sports Facility. Offices have a much more balanced heat/cool demand requirement. Over time, CCHL expects that demand growth for cooling will exceed demand growth for heating as building occupiers' demand for more comfortable environments increases.

Additional Demand

Total Central City energy demand will easily exceed the 56MW that has been mapped across the four hubs. This will be a mixture of commercial offices, retail, accommodation, entertainment and inner-city living. For the narrow purpose of creating an illustrative business concept that can easily be supported by third-party financial providers, this additional demand has not been included.

Exhibit 1: Identified Blue-Chip Client Demand (MW)

	Current	2015	2020	Peak
Cooling Demand:	0.7	4.0	11.9	16.9
-Health & Fitness	0.0	1.0	3.5	8.0
-Arts & Culture	0.0	0.0	4.6	4.6
-Administration & Innovation	0.0	2.1	2.6	2.8
-Technology	0.7	0.9	1.2	1.5
Heating Demand:	11.7	18.1	34.3	39.0
-Health & Fitness	8.9	11.7	22.2	26.7
-Arts & Culture	0.0	0.0	5.1	5.1
-Administration & Innovation	0.0	3.3	3.6	3.8
-Technology	2.8	3.1	3.4	3.4

Source: CCHL estimates

Note: Appendix 2 lists hub demand by end-user client

2.2 Illustrative Design

System design will depend on the location and demand profile of key clients. Appendix 1 to this document contains *an illustration of the type of system that could be built*. The schematic is based around the blue-chip potential client base identified above and is included for information purposes only. CCHL does not represent or warrant the accuracy of such information. This schematic has four discrete hubs:

- **Health & Fitness.** This group of clients would be served by heat supplied from the existing hospital boilerhouse. Cooling demand could be met using either decentralized chiller systems, or a chilled water network supplied from either absorption chillers or aquifer-sourced cooling. The

three largest clients in this space would be the Christchurch Hospital, Metro Sports and the Health Precinct. This geographically small but energy-dense hub accounts for over half of the total energy demand of the entire Christchurch DES.

- **Arts & Culture.** Demand in this hub is underwritten by the Convention Centre and associated hotels, the rebuilt Central Library and the Performing Arts Precinct.
- **Administration & Innovation.** This hub contains the Justice Precinct, the Bus Interchange, Environment Canterbury's new 200 Tuam Street Headquarters building and the Innovation Precinct.
- **CPIT.** The CPIT Madras Street campus comprises 50,000 square metres of office, teaching and residential space. It is large enough to be classified as a hub in its own right. CPIT is interested in a system that would allow it to retire its existing legacy systems.

Respondents may also wish to consider potential demand from the following projects (which were excluded from the above capacity data):

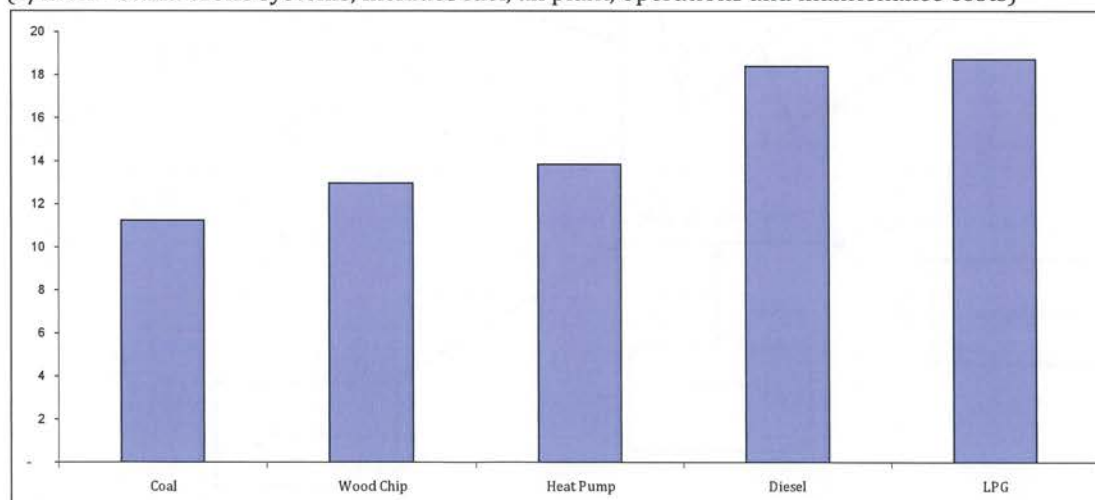
- Redevelopment of the Canterbury Museum (c. 1.5MW load);
- Arts Centre rebuild (c. 2MW load);
- New Government Offices in the Christchurch Central City (c. 4MW load – 25,000 square metres of space, locations to be determined);
- The Retail Precinct (approximately 40,000 square metres of space, multiple building owners);
- Central City housing developments (probably high-density); and
- New office, retail, entertainment and accommodation spaces being developed across the central city

2.3 Energy Pricing

For it to be successful, the Christchurch DES will need to offer competitive energy prices. Exhibit 2 contains CCHL's current best-estimate of current delivered energy costs based on different fuel-types.

Exhibit 2: Fully-Loaded Energy Costs by Fuel-Type

(c/kWh – stand-alone systems, includes fuel, all plant, operations and maintenance costs)



Source: CCHL estimates

Note: Assumes 8% cost of capital, 25 year straight line depreciation. Heat Pump is air-driven.

3. Hub-Type 1 - Heat-Only

The opportunity exists to create a discrete heat-hub at the south-west corner of the Christchurch CBD. This geographically small but energy-dense heat-only network would be powered initially by the existing hospital boilerhouse. This facility houses new coal-fired boilers generating heat energy at an attractive cost.

Customer demand from this heat-only hub is expected to increase from 8MW currently to over 20MW by 2020 and to peak at close to 30MW. Attractive revenue growth rates would be underwritten by increased demand from its strong and stable anchor clients (including, the Hospital, the Health Precinct, the Metro-Sports Facility and Hagley Community College).

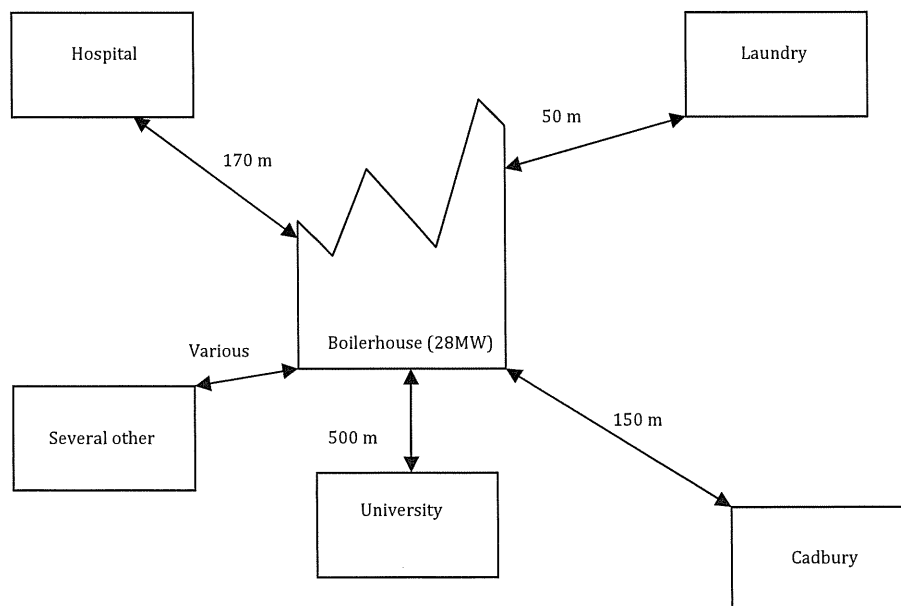
Over time, additional customers with high heat-only requirements (such as commercial laundries) might preferentially locate close to the Heat Hub, allowing for further revenue growth. In addition, entities that generate waste heat, such as data centres, might also choose to locate to this area so they could “sell” their excess heat into the Heat Hub.

The CDHB wishes to use this EoI as a route to identifying partner(s) with which it could develop this business opportunity.

3.1 Dunedin Energy Centre as a Model for a Christchurch Heat Hub

This system has approximately 28MW of installed coal/woodchip boilers originally purchased from the Southern District Health Board. It supplies high-temperature reticulated steam to a number of nearby customers including the Dunedin Hospital, Cadbury Confectionary, Alsco (a commercial laundry), Otago University and a number of smaller business customers.

Exhibit 3: Dunedin Energy Centre Schematic



Source: EFI

Through the process of creating the Dunedin Energy Centre, the Southern District Health Board outsourced its energy supply requirements and sold its energy assets. Through this process it saved approximately \$3 million in future capital expenditures. It also mitigated a range of business risks and redirected its spending towards patient care.

CCHL believes that the Energy Centre is a successful business, offering its customers reliable and low-cost energy by virtue of:

- Its purchase of assets at written-down valuation;
- Short pipeline lengths – which minimizes capital costs and maximizes system efficiency;
- Fueled primarily by low-cost coal and inexpensive local low-grade wood;
- Long operating hours at its principal customers, ensuring high capacity utilization rates; and
- Growth of customer loads and the addition of new customers, which has delivered revenue growth, lower unit costs of production and reduced costs of redundant capacity

3.2 Adapting the Dunedin System for Christchurch

Early stage feasibility analyses identified the existing boilerhouse of the Christchurch Hospital as a potential heat-source for the Christchurch DES. From the perspective of a DES operator this would be economically rational as it leverages excess capacity at an existing asset for the benefit of nearby customers.

3.3 Christchurch Hospital Boilerhouse (45 St Asaph Street)

The existing hospital boilerhouse sits on a city block bordered by St Asaph Street, Antigua Street, Tuam Street and Hagley Avenue. The boilerhouse is owned by the Canterbury DHB and is on land that is intended to form part of the Health Precinct.

27MW of existing supply, 8MW of current peak hospital demand. The existing Christchurch Hospital boilerhouse currently contains three new boilers, installed between 2010 and 2012. Each is capable of supplying the hospital site with 7MW of heat (measured as it leaves the boilerhouse). Two of the boilers are coal (which could be converted to woodchip firing). The third boiler is dual-fuel (diesel/LPG) and operates as a standby boiler. The boilerhouse has space for a fourth similar-sized boiler, should that be required at any stage. In addition, the hospital currently leases five containerized 1.2MW diesel backup boilers, located across its main campus site.

3.4 Invested Capital of Hospital Boilerhouse

In 2012, MWH estimated the replacement value of the hospital boilerhouse at \$21.8 million.

Exhibit 4: Indicative Capital Associated with Hospital Boilerhouse
(\$, millions)

Component	Replacement Value	Comments
Building	4.0	Includes recent upgrades (\$2 million)
Land	1.0	1,000 m ² at \$1,000/m ²
Existing Services & Equipment	2.0	Estimated current value
Boiler Plant & Equipment	12.0	Based on Lyttelton Engineering contract
New Stack	2.5	Estimated cost for coal-related stack; could be less if woodchip fueled
External Services	0.3	
Total	21.8	

Source: MWH

Note: Assumes that all required projects (such as baghouse and new stack) are completed

3.5 Additional Capital Required for Seismic Upgrades

The Christchurch Hospital boilers and boilerhouse were designed and approved prior to the September 2010 earthquake. After the February 2011 earthquake, seismic structural design loads have increased by approximately 36%. As the building and equipment are existing assets, there is no mandatory requirement to carry out these upgrades, but the CDHB may require upgrades to be made as a matter of policy. The following describes the major capital projects required to attain full earthquake compliance:

- **Boilerhouse Structure and Foundations.** The boilerhouse was designed to meet pre-2011 earthquake standards and as such is below current standards. If the boilerhouse is converted to woodchips the coal hoppers become redundant. This would reduce the scope of works required to attain full compliance with current earthquake standards due to the significant reduction in weight high up the building.
- **Bagfilter Platform and Foundations (included in Exhibit 4 above).** Designed to current earthquake standards. The foundations and ground level concrete slab have been installed. The above ground steelwork has been fabricated but not yet installed.
- **Diesel Boiler.** Designed to a now superseded standard (NZS4203). Will need upgrading to comply with current requirements and the current design standard AS/NZS1170.
- **Diesel Boiler Stack.** Designed to pre-earthquake standards. An increase in design loads of is required if upgrading to the latest standards.
- **Coal Boiler.** Designed to pre-earthquake standards.
- **Baghouse (included in Exhibit 4 above).** Designed to pre-earthquake standards.
- **Chimney (included in Exhibit 4 above).** The 55mm concrete and brick-lined boilerhouse chimney was demolished in 2012 due to irreparable structural earthquake damage. As a result, the coal boilers are currently operating through lower temporary steel stacks. Should the coal boilers be converted to woodchip (lower sulphur and other emissions content), then a lower height replacement chimney would be possible, subject to ECan consent. The CDHB is currently drawing up a proposal for these works.

- **Existing Steam Pipework (Boilerhouse and Service Tunnels to the Hospital).** Steam pipes, located in an underground Service Tunnel, connect the Hospital Boilerhouse to the main hospital site. This component of the hospital's heating system is the most vulnerable to additional earthquake damage.

3.6 Additional Capital Required for Woodchip Conversion

With a small number of modifications, the CDHB's new coal boilers are suitable for burning woodchips. The CDHB has investigated the one-time capital costs of switching to woodchip firing:

- \$5.2 million (ex GST, 2012 prices), for in-silo storage of fuel
- \$2.2 million (ex GST, 2012 prices) for on-ground storage of fuel

Prior to the earthquakes, on-ground storage of woodchips was not a viable option. This was because of the lack of available space. Depending on the design of the Health Precinct, building demolitions resulting from the earthquakes could make on-ground storage a viable option. Should the boilers be converted to woodchip firing, the boilerhouse would avoid the need to invest \$250,000 in seismic upgrades of its coal hoppers. Conversion would, however, lead to additional operating costs (ex-fuel) of approximately \$25,000 per year. Fuel costs for woodchip are currently higher than for coal, partly because of low ETS charges.

Increased capacity utilization of the hospital boilers, achieved by supplying additional customers, could allow for partial conversion to woodchip fueling while holding unit costs of production at constant levels. CCHL believes that a proposal of this nature would be of interest to the CDHB.

3.7 Additional Capital required for Steam to Hot Water Conversion

The hospital boilerhouse currently delivers heat energy to the hospital via reticulated 8.3 Bar_g steam. Converting this steam-system to a hot-water system would lead to lower energy and maintenance costs for the hospital by around \$230,000 per year. An additional benefit of conversion to hot water is that hot water systems have more energy storage options than steam systems. This might allow for greater demand to be supported without increasing boiler capacity.

In 2012, MWH estimated the cost of a hot-water to steam conversion for the whole hospital of \$4.1million. Excluding buildings that are likely to be redeveloped (and which should be funded out of the redevelopment budget), this cost falls to around \$1.6million. Of this, around \$1 million relates to the cost of replacing/strengthening the existing steam pipes that connect the hospital boilerhouse to the main hospital site.

3.8 Additional Capital Required for On-site Backup Boilers

Because of seismic resiliency issues around the steam pipes in the Service Tunnel, the hospital currently leases five 1.2MW containerized diesel boilers on the main hospital site. The rental cost of these boilers (approximately \$500,000

per year) means that this is not a sustainable solution. The hospital is considering replacing these temporary boilers with a permanent main-site back-up diesel boiler.

3.9 CDHB's Boilerhouse Ownership Options

The hospital has a range of options in relation to its boilerhouse, including:

Option 1 – Status Quo. The existing boilerhouse continues to supply only the hospital's own heating requirements.

Option 2 - Retain ownership of the boilerhouse; sell excess capacity to nearby customers.

Option 3 – Sell boilerhouse to a 3rd party, become an energy customer of that entity.

Option 4 – A partnership structure between the CDHB and a 3rd party, with different boilerhouse assets owned/leased by different parties.

The CDHB is considering all of its options in relation to the boilerhouse and is open-minded as regards to the best outcome. It intends that responses to this EoI will inform its decision as to the most beneficial course of action.

The final decision on matters relating to the hospital boilerhouse rests exclusively with the CDHB. Any change to the current arrangements will need to be made on acceptable commercial terms. However, the CDHB has two specific non-negotiable requirements:

- **Absolute supply security.** The Christchurch hospital is a 24/7 facility delivering critical patient care. The hospital invests heavily in ensuring that all of its systems are reliable and resilient. It requires sufficient backups to be in place to guarantee continuous operation. That the hospital remained fully functioning through the recent Christchurch earthquakes evidences the resiliency of its operations. There can be no interruptions to energy supply to the hospital site.
- **Improved financial outcomes.** Any change to the current arrangements would need to offer clear financial advantages to the hospital. This could be either in terms of lower costs, additional revenue streams, or lower future capital spending obligations.

3.10 Existing Christchurch Hospital Energy Costs

Christchurch Hospital currently generates heat energy at a cost of 9.1c/kWh (including depreciation, but excluding financing costs). The largest single component of this cost is fuel for the boilers (4.2c/kWh). Included in this cost is \$367,000 (0.9c/kWh) for operational labour at the boilerhouse. This cost should, over time, trend to zero as the new boilers are designated as unattended.

Based on the cost information contained in Exhibit 5 below, we calculate marginal costs of production of 4.3c/kWh, assuming that the fuel mix used in the boilerhouse remains constant.

Exhibit 5: Existing Hospital Energy Costs

(2011/2012)

Cost Component	Cost (\$)	Cost (c/kWh)	Comment
Coal	1,532,488		Ash disposal included
LPG	110,678		For running backup boiler
Electricity	53,640		
Total Fuel Costs	1,696,806	4.2	Variable cost of production
Consumables	32,000	0.1	Variable cost
Operational Labour	367,000	0.9	Should trend to zero as new boilers are designated unattended
Maintenance	199,000	0.5	Fixed cost of production
Allocated CDHB Overheads	80,000	0.2	Fixed cost
Depreciation	832,000	2.0	25 year lifespan for all PP&E except land. Fixed cost
Backup Boiler Lease	500,000	1.2	Fixed cost, being replaced by new, permanent boiler
Total Costs (ex-funding)	3,706,806	9.1	

Source: MWH/CDHB

Note: Costs based on energy delivered in 2011/12 financial year of 40,682 MWh

3.11 Core Heat Hub Customers

In the first instance, the Heat Hub would supply a small number of core customers, with others expected to join over time:

- **Christchurch Hospital.** An existing base load of demand that peaks at around 8MW currently. This is expected to grow to 15MW once the hospital is fully redeveloped.
- **Health Precinct.** The Health Precinct is one of the Anchor Projects in the Christchurch Central Recovery Plan. The project is being led by the CCDU. Its partners in this initiative include the CDHB, Otago and Canterbury Universities, CPIT and the private sector. The precinct will bring together private research and professional partners and medi-hotels where patients and families can stay while receiving outpatient or specialist care. This is a 20-year project that involves the creation of 225,000 square metres of new buildings space.
- **Metro-Sports.** This facility is located directly across St. Asaph Street from the hospital boilerhouse. It is expected to be operational by the end of 2016. Estimated heat energy requirement for this complex is around 3MW although design work for the facility has not yet started.
- **Hagley Community College.** Currently uses around 0.7MW of heat generated by two 350KW diesel boilers.

Exhibit 6: Anticipated Heat Hub Demand

(Demand in MW)

Customer	Current (Act.)	2015 (Est.)	2020 (Est.)	Peak (Est.)
Christchurch Hospital	8.2	10.0	15.0	15.0
Health Precinct	0.0	1.0	3.5	8.0
Metro Sports	0.0	0.0	3.0	3.0
Hagley Community College	0.7	0.7	0.7	0.7
Total Heat Hub Demand	8.8	11.7	22.2	26.7

Source: CDHB (for Christchurch Hospital), Aurecon (for Health Precinct and Metro Sports), Ministry of Education (for Hagley Community College)

3.12 Energy Pricing

Product pricing will be important to every potential customer of the Heat Hub. Customers will not connect to the Heat Hub unless pricing is competitive with available alternatives. The CDHB has already made clear that it requires both absolute supply security and improved financial outcomes. The Heat Hub operator will need to balance its use of low-cost coal with its customers' potential demand for more renewable fuels.

3.13 Business Case for the Christchurch Heat Hub

The Christchurch Heat Hub has a number of attractive attributes:

- Blue-chip customer base;
- Short pipeline lengths between the source of heat generation and its principal customers;
- Long operating hours at its principal customers, ensuring high capacity utilization rates;
- Strong growth in demand from new customers and hospital expansion/redevelopment;
- An existing heat source asset that contains new, high-quality and energy-efficient boilers, with the potential for additional capacity in the existing building;
- Fueled by low-cost coal (giving low marginal costs of production), but with the option of switching to renewable (and currently more expensive) woodchips;
- Excess current capacity; and
- Ability to optimize demand across multiple user groups, and hence to squeeze additional capacity out of the existing assets.

4. Hub-Type 2 – Heat & Cool

DES design needs to take account of the fact that, excluding the Heat Hub, Central City demand for cooling is likely to be approximately the same as the demand for heating. This is because modern office buildings are well insulated, source substantial amounts of their heat from passive sources, but also contain large numbers of heat-generating computers. In meeting this balanced energy need, heat pumps are attractive because they are inexpensive to run and maintain, are a proven and reliable technology, and (in the South Island) are powered by largely-renewable electricity. Heat-pumps that use water as their latent energy source are more energy efficient than air-based systems; energy efficiency is one of the goals of the DES.

4.1 Concept – Non-Consumptive Aquifer Use

Christchurch sits on a series of substantial confined aquifers that facilitate the movement of fresh water from the foothills of the Southern Alps into the South Pacific. Because of this underground infrastructure, the opportunity exists to:

- Abstract constant-temperature water from the aquifers through a number of bores/wells;
- Distribute the water such that it can be used as a latent energy source for water-based heat-pumps (either owned by building owners or potentially owned by the DES itself); and
- Return the water to the aquifer via reinjection wells.

The quality and composition of the aquifer water is unaffected by this process, as are aquifer levels.

Across New Zealand, GNS Science (Crown Research Institute) believes that aquifer water is currently used to drive approximately 100MW of heating and cooling load. 80-90% of this national energy load is located in Christchurch. CCHL understands that Christchurch International Airport Ltd (CIAL) is the country's largest single user of this technology (introduced as part of its Terminal Upgrade Programme).

4.2 System Benefits

CCHL sees this system as having a number of attractions:

- **Heating and Cooling.** Unlike heat-only boilers, heat-pumps deliver both heating and cooling to customers
- **Low Infrastructure Costs.** Wells are inexpensive to drill (approximately \$300k/pair for a 50 litres/second capability). Uninsulated HDPE pipes may be appropriate given low network temperatures. These are cheaper and more earthquake resilient than insulated steel pipes. They can, in some cases, be tunneled (directional drilled) underground rather than being placed in excavated trenches. In the simplest and lowest-capital variant of the system, in-building heat pumps and heat exchangers would be owned by the building owners, drawing on reticulated aquifer water.
- **Energy Efficiency.** Broadly, water-based heat pumps are around twice as energy efficient as air-based heat pumps. This is because energy is being

extracted from constant-temperature water (13-14 degrees celsius) instead of variable-temperature air. Improved energy efficiency is one of the goals of the District Energy System.

- **Clean / Environmental Benefits.** The system runs off electricity, which is predominantly renewable in the South Island. There is no trucking and storage of fuels and no central-city combustion or emissions. Aquifer levels would not be affected as abstracted water is reinjected – the only change to the water is that heat is either added (in the summer) or removed (in the winter). This system has virtually no above-ground infrastructure, and so the street-scape would be largely unaffected.
- **Low Technology Risk.** Heat-pumps operate off established technology that is well-understood by building owners and the design/engineering community. Similar systems exist elsewhere in the world, but are mostly cooling-only systems based off low-temperature water (such as deep lakes/cold-oceans etc).
- **Phased Build-Out.** Given the need for multiple wells, this system would best be developed as a series of hubs or nodes around key clients. These nodes could subsequently be linked together with additional wells and heat pumps added as demand spreads. A phased build-out would reduce up-front investment, potentially reduce network costs, reducing risk and boosting returns.

4.4 Aquifer Protection / Environment Canterbury Consents

Christchurch's urban residents enjoy some of the highest-quality drinking water in the world. The City Council is committed to maintaining high water quality standards. Use of aquifer water to drive the system's heat pumps will only be considered if it brings no change to the city's water quality or additional risks to its supply.

CCHL has approached ECan to get its preliminary view on use of the aquifer.

Under the Resource Management Act (RMA) an abstraction of this nature will require Resource Consent. The taking from, and discharge to, the same aquifer is not regarded as consumptive, and hence is allowed under both the Natural Resources Regional Plan (NRRP – the current operative plan) and also the Proposed Land and Water Regional Plan (LWRP), although a consent is likely to be required.

A 15MW system with a 6 degree temperature change (between water abstracted and reinjected) requires a flow rate of approximately 600 litres per second. This would be a large abstraction requiring careful planning. This flow rate could be derived from around 12 pairs of wells, distributed through the central city, each delivering 50 litres per second.

Subject to the impact on the environment (ground water aquifers) and other users, ECan's preliminary assessment is that the consent may not need to be notified. Non-notified Resource Consent applications are normally processed by ECan in 20 business days. Should a fully-notified process be required, this could

take up to 6 months. Both of these estimates assume that ECan, through its pre-consent advisory service, is involved early in defining the technical studies and information required for the process.

4.5 Benefits of Centralised Delivery of Aquifer Water

All DES' must be able to articulate why a "district" approach to energy provision offers benefits to customers that individual building-by-building solutions lack. In the case of centralized aquifer use, the following advantages emerge:

- **Increased use of the aquifer – greater energy savings, reduced environmental impacts.** Small & medium size developments often do not consider the use of aquifer-driven heat pumps. This is because of the time required for consents and the uncertainty of outcomes. A large cross-city consent, that individual buildings could tap into, would increase the use of clean and efficient water-based heat-pumps over alternative (and perhaps more polluting) heating/cooling technologies.
- **Integrated resource management.** ECan has signaled that it would prefer a large central consent over a myriad of individual consents. This is because it makes it easier to oversee aquifer use. ECan also believes that a large well-managed consent would allow for more integrated use and protection of the aquifer resource.
- **Shared well costs.** Smaller developments often do not have large enough energy needs to justify the costs associated with consenting and drilling of abstraction/reinjection wells. Sharing this infrastructure and cost across several buildings makes this a more viable option.
- **Ease of use.** Readily accessible and well-priced aquifer water would make it easy for new clients to connect to the DES.

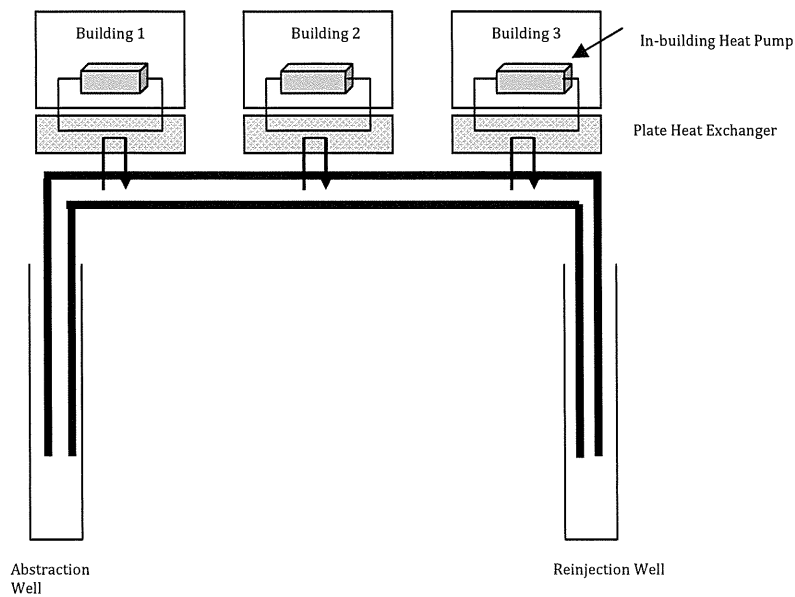
4.6 Alternative System Designs

Exhibit 7 below outlines one version of this scheme. In this version, the infrastructure company owns the pipe network, the wells, and the ECan consent. Individual building owners retain the plate heat-exchangers and their own in-building heat pumps.

An alternative approach is for the infrastructure company to also own the heat exchangers and heat pumps. In this instance, dual pipeline networks would move heated and chilled water around the central city. This option would likely be more attractive to building owners as it would reduce their up-front investment in plant & equipment.

Respondents to this EoI should indicate which of these alternative designs they believe is preferable for the Christchurch DES.

Exhibit 7: Reticulated Artesian Water Schematic



Source: Golder Associates, CCHL

4.7 Business Case for the Christchurch Heating/Cooling Network

The Christchurch Heating/Cooling Network has a number of attractive attributes:

- Broad product offer – heat and cool
- Depending on system design, the product offer could be very low-capital for building owners/developers
- Blue-chip customer base (Anchor Projects plus others)
- Once established, the business would have high barriers to entry by virtue of its ownership of city-wide Resource Consent and well infrastructure
- Energy-efficiency benefits can be shared between system owners and customers
- Renewable energy supply
- Staged build-out allows for better financial returns
- Multiple wells required for aquifer abstraction allows for short pipeline lengths between wells and customers
- No emissions issues

5. Timetable & Communications

5.1 Indicative Timetable

The following table contains estimated key dates. CCHL reserves the right to change any dates provided.

Event	Indicative Date
Issue of EoI:	11 July 2013
Questions to CCHL, in writing, by:	1 August 2013
Answers posted on GETS:	8 August 2013
You must respond to this EoI by:	29 August 2013

5.2 Questions

All communications relating to this EoI, or requests for clarification or further information, must be emailed to Peter Houghton, the CCHL DES Project Manager at peter.houghton@cchl.co.nz. Peter Houghton is the only person authorized to receive queries, requests for information or other communications.

All questions, requests for clarification or requests for further information are to be e-mailed to the CCHL DES Project Manager by 5pm on Thursday 1 August 2013. Any requests received after this time and date may or may not be responded to, at CCHL's sole discretion. CCHL will combine all the questions and post combined responses, on GETS (www.gets.govt.nz) by 5pm on Thursday 8 August 2013.

If a respondent deems a question to be confidential or unique to their response, they may request that the question and answer be excluded from general publication. All requests to have a question and answer excluded from general publication must be accompanied with a reason for the exclusion. If CCHL deems the information to be relevant to all parties, CCHL will contact the respondent seeking its consent to the publication of the question and answer to all respondents. Non-consent will result in the question being deemed to be withdrawn.

Respondents should note that CCHL is bound by the Official Information Act 1982 and that their confidential questions may be required to be disclosed by CCHL to a third-party under that Act.

6. EoI Terms & Conditions

These EoI Terms and Conditions shall apply to this EoI and shall be applicable to CCHL, its partners and potential partners, and respondents. Where the EoI refers to CCHL having a right or discretion this right or discretion extends to all its partners and potential partners.

When undertaking the evaluation of any responses and making any future decisions, each party reserves the right to act in its own best interests.

6.1 Acceptance of Terms & Conditions

By submitting a response, the Respondent accepts that it is bound by the terms and conditions set out in this Invitation for EoI.

6.2 Format of Responses

All Responses to the EoI must be in writing and must address all of the issues identified in Section 7 of this EoI. Responses must be provided in the English language although responses that include Māori language will also be acceptable. The response must be signed by your duly authorized representative.

Responses should be no longer than 20 single-sided A4 pages (inclusive of all cover sheets, tables of contents, concept designs, sketch plans, drawings, and financial spreadsheets).

6.3 Delivery of Responses to CCHL

Responses can be delivered in either electronic or physical form. For **physical delivery**, a single hard Response should be delivered to the following address:

Peter Houghton
DES Project Manager
Christchurch City Holdings Limited
Civic Offices: 53 Hereford Street
PO Box 73016, Christchurch 8154
New Zealand

For **electronic delivery**, an Adobe PDF file should be sent to:

peter.houghton@cchl.co.nz

Fax responses will not be accepted.

6.4 Closing Date

The closing date for Responses is Thursday 29 August 2013. CCHL reserves the right, at its sole discretion, to extend the closing date for Responses. CCHL may decline to consider Responses received after the closing date at its absolute discretion. Any late response in which CCHL chooses not to exercise its discretion shall be returned unopened to the respondent. No responsibility is accepted by CCHL for Responses delivered to the wrong address.

6.5 Notification of EoI Outcome

The shortlisted respondent(s) (if any) will be advised that they have been selected to participate in the next phase of the EoI process.

CCHL will notify all unsuccessful respondents that they have not been invited to participate in the next stage of the process. Upon request, CCHL will provide brief reasons to unsuccessful respondents.

6.6 Conflicts of Interest

Each Respondent must disclose any actual or potential conflict of interest (whether real or perceived) in relation to matters covered by this EoI.

6.7 Publicity

The Respondents must not make any public statements regarding this EoI without prior written consent from CCHL.

Unauthorized communication by you about this EoI or with CCHL and/or the other partners in relation to this EoI may, at CCHL's sole discretion, lead to your disqualification from this EoI process.

You must not publish any advertising, press release or other information relating to this EoI.

6.8 Representations / Additional Information

CCHL has used reasonable efforts in compiling this EoI. CCHL will not be liable to the Respondents or any other person for any inaccuracy or omission in this EoI or any additional information that CCHL may provide.

6.9 Cost of Response

The Respondent shall be responsible for all costs associated with the preparation and submission of its Response.

6.10 Property of CCHL

All submitted Responses and any material submitted by the Respondents to substantiate the Responses becomes the property of CCHL and will not be returned to the Respondents at any stage.

Intellectual property in a Response to this EoI will not pass to CCHL. However, by submitting a Response, each respondent licenses CCHL to use, copy, adapt, modify and reproduce responses.

6.11 Information Complete and Accurate

By submitting a response, each Respondent warrants that all information provided by them to CCHL in, or in relation to, the response is complete and accurate in all material aspects. Each Respondent also warrants to CCHL that the provision of that information to CCHL, and any use of it by CCHL for the evaluation of the response, any resulting negotiation, and any other use related

to the process and next steps will not breach any third-party intellectual property rights.

6.12 Respondents to Inform Themselves

CCHL makes no representation and gives no warranty as to the accuracy or completeness of any information it has or will provide in connection with the Invitation for EoI process. CCHL accepts no liability on account of errors in any statements made or data provided in the course of response preparation, within the Invitation for EoI document itself or subsequent negotiations and each respondent must rely on their own enquiries.

6.13 Joint Responses

Interested parties may submit joint responses provided that the requirements of the EoI are met. CCHL and its stakeholder partners have a preference for simple and clear relationships with proposers and may take into account in its evaluation any risk or complexity inherent in joint responses.

6.14 Confidentiality

6.14.1 Third Party

The content of this EoI is confidential to CCHL. All information contained in this document or given to a Respondent by CCHL is for the sole purpose of allowing Respondents to prepare the Response. No information contained in or regarding this EoI may be used by a Respondent in any other context, nor divulged to any third party without the specific written authority of CCHL. All such information must be treated as confidential and communicated only to the people directly involved in the preparation of a Respondent's Response who need to know the same.

6.14.2 Disclosure to third parties by CCHL

CCHL may be required to disclose information if requested to do so in terms of the Official Information Act 1982.

Respondent information, Responses and draft Agreements may also be made available to, or otherwise reviewed by, other Government representatives, Agencies, and bodies including the State Services Commission, Treasury, Officers of Parliament, Ministers of the Crown, Parliamentary Select Committees, and Royal Commissions and Canterbury Earthquake Recovery Authority (CERA).

6.14.3 Commercially Sensitive

The Respondent must clearly identify in the Response those specific parts of its Response that are commercially sensitive and confidential in nature. It will not be acceptable to identify the entire Response as commercially sensitive and confidential.

CCHL shall use reasonable efforts to maintain the commercially sensitive and confidential nature of that information and not disclose such information to third parties, other than Participating Agencies' advisors, contractors or to referees (nominated at CCHL's/the Participating Agencies' sole discretion).

6.15 Rights Reserved

Notwithstanding any stated evaluation method, CCHL has complete discretion to consider, not consider, accept, or reject any Response (including any late or otherwise Non-Compliant Response) and complete discretion as to Response evaluation methods.

Without limiting any other EoI condition or other requirement of this EoI, CCHL reserves the right to at any time at its sole discretion, and without incurring liability to any Respondent or any other person, to:

- Apply, or change any policy or criteria relating to participation in this EoI Process or evaluation of Responses;
- Exclude any person or include any person in this EoI Process for any reason at any time, without notice;
- Change CCHL's requirements in respect of the system;
- Suspend or cancel this EoI Process by notice to the Respondents;
- Contact any person who has previously engaged the Respondent (or any proposed contractor of the Respondent) for reference purposes;
- Cancel, amend or withdraw all or part of this EoI, and/or process under it, at any stage prior to the signing of an Agreement;
- Change (extend or shorten) any date in this EoI Process;
- Accept, or decline to consider, Responses received after the closing date;
- After the deadline for delivery of the Responses, negotiate without restriction with any Respondent on any matter contained in its Response;
- Re-advertise for Responses and accept additional Responses; or
- Waive any irregularities or formalities in this EoI Process.

Neither the Invitation for EoI nor the EoI process shall create any contractual, equitable or other obligations on CCHL or any right in favour of an interested respondent that is enforceable against CCHL. In particular, and without limit, this EoI is not a contractual offer.

6.16 No Obligations

Neither the Invitation for EoI nor the EoI process shall create any legal or other obligations between the respondent or CCHL or any stakeholders in relation to the conduct or outcome of this EoI process.

CCHL and the stakeholders, their agents and advisors shall not be liable in contract or tort or in any other way for any direct or indirect damage, loss or cost incurred by any respondent or any other person in response of the EoI process.

6.17 Governing Law

This Invitation for EoI is governed by New Zealand law and each respondent submits to the exclusive jurisdiction of the New Zealand courts as to all matters relating to this Invitation for EoI.

7. Information Required from Respondents

EoI responses must address the following:

7.1 The Team / Consortium

Delivery of the Christchurch DES will require that a broad range of expertise and skills will be present within your team.

Respondents are required to provide detail of each proposed member organization of your team, including:

- A brief profile outlining capability, expertise and organization structure.
- A list of consultants, advisors and subcontractors that have been, or are anticipated to be, engaged by you to assist in participation in subsequent procurement stages if you are short-listed.
- Disclosure of all related party participants that may be part of a separate Christchurch DES EoI response.
- Demonstration of financial capacity to implement the Christchurch DES as proposed in your EoI response.

7.2 DES Design and Construction

As part of your EoI response you need to address the following issues:

- The specific design components that you consider will contribute to the Christchurch DES achieving the four broad goals set out in section 1.1 of this EoI.
- Whether your DES is a network model or a hub model.
- The expected geographic footprint of your proposed DES, including the location and size of any proposed hubs.
- Your expectations for peak supply (of both heating and cooling, expressed in MW, of the Christchurch DES at end 2020, end 2025 and end 2030.
- Your expectations for the MWh of heat and cooling delivered for the Christchurch DES for the 2020, 2025 and 2030 years)
- The date at which you anticipate that the DES would commence operation (the Operational Start Date - OSD), and the critical dependencies that influence that date.
- The phasing/material milestones of the design and build-out of the Christchurch DES
- The opportunities you perceive for innovation in the design, operation or any other aspect of the Christchurch DES that would improve on the system proposed by CCHL.
- The fuel source(s) that you anticipate will power the Christchurch DES, their price, availability, security of supply and any other factors that could influence the operation of the EoI.
- Any other actions that you / your consortium could take to enhance the benefits expected from the design, construction and operation of the Christchurch DES.
- The expected operating temperatures of the Christchurch DES.
- The physical demarcation point, in the proposed system between DES and customer responsibilities/assets.

- Anticipated system minimum availability (the percentage of the year in which the system would be operational).

7.3 Financing & Ownership

- The most effective operating model, ownership structure and governance arrangements for the Christchurch DES. Your EoI Response should specifically address the ownership structure proposed for Heat Hub assets including the Hospital Boilerhouse.
- The high-level approximate costs of creating a Christchurch DES (of the type you have described above). Costs can be expressed in a total cost of the system or your estimate of costs per MW of energy supplied.
- A breakdown of total project cost into the four or five estimated key components (e.g. boilers/energy sources, network, other plant, operating expenses, financing costs).
- Estimated sources of financing. Specifically: (i) what financing is anticipated to be provided by you/your consortium; (ii) what financing is anticipated from other private sector sources and how that financing will be obtained; and (iii) what financing may be requested from public-sector sources such as CCC and/or CCHL.
- Expected capital structure of the Christchurch DES at OSD.
- Your view of estimated DES pre-tax cost of debt.
- Anticipated peak debt levels of the Christchurch DES.

7.4 Consents to Operate:

- What Resource or other Consents would be required to build and operate your planned DES.
- What issues, if any, do you perceive in gaining of the above Consents.

7.5 Customer Offer:

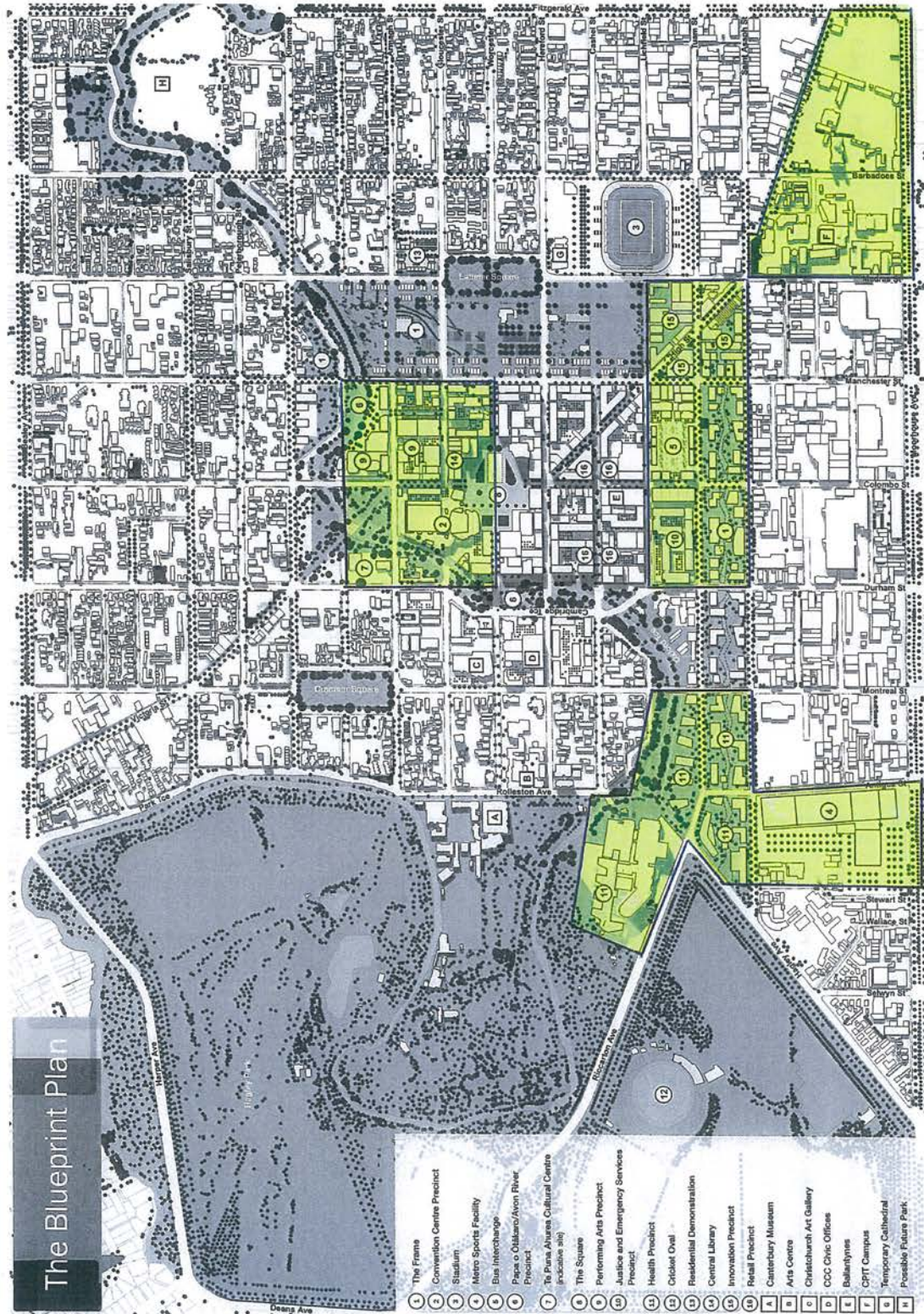
- The size of the proposed system, expressed in MW of cool and heat demand supplied. This should take into account your views on client thermal demand as well as the share of the Central City energy market that you believe the system will capture.
- The energy price (on a fully-loaded basis, including all fixed and variable components, excluding GST) that you anticipate customers will pay at OSD.
- Your preliminary views as to the balance of customer charges between fixed charges associated with the operation, maintenance and availability of the system and variable charges associated with the actual quantity of energy supplied.
- Your views as to the duration of supply contracts between the DES operator and its customers, and the mechanism(s) you propose for price escalation/indexation.

7.6 Risks:

- Respondents should identify the principal risks contained in their proposals and how they propose these risks should be managed and/or mitigated.

- Respondents should identify which of the above risks they intend will reside with them, and which will be held by other parties.
- Respondents should indicate what insurances they will require to build and operate the system.
- Respondents should include a summary of their Health & Safety policy and performance.

Appendix 1: Illustrative Heat & Cool Hubs



Appendix 2: Hub Demand by End-User Client

Hub:	Client	Total	Cooling Demand (MW)			Heating Demand (MW)		
			Current	2015	2020	Current	2015	2020
Total Identified Demand:		55.9	0.7	4.0	11.9	11.7	18.1	34.3
Health & Fitness Hub:								
	Total H&F	34.7	-	1.0	3.5	8.9	11.7	22.2
	Metro Sports	3.0	-	-	-	-	-	3.0
	Health Precinct	16.0	-	1.0	3.5	-	1.0	3.5
	Christchurch Hospital	15.0	-	-	-	8.2	10.0	15.0
	Hagley Community College	0.7	-	-	-	0.7	0.7	0.7
Arts & Culture Hub:								
	Total A&C	9.7	-	-	4.6	-	-	5.1
	Performing Arts Precinct	2.0	-	-	1.0	-	-	1.0
	Central Library	1.2	-	-	0.6	-	-	0.6
	Convention Centre	2.0	-	-	1.0	-	-	1.0
	Convention Centre Hotels (3)	2.5	-	-	1.0	-	-	1.5
	Town Hall	2.0	-	-	1.0	-	-	1.0
Administration & Innovation Hub:								
	Total A&I	6.6	-	2.1	2.6	-	3.3	3.6
	ECan HQ	1.2	-	0.6	0.6	-	0.6	0.6
	Justice Precinct	3.0	-	0.8	1.0	-	2.0	2.0
	Bus Interchange	0.4	-	-	-	-	-	0.2
	Innovation Centre	2.0	-	0.7	1.0	-	0.7	1.0
Technology Hub:								
	Total Tech.	4.9	0.7	0.9	1.2	2.8	3.1	3.4
	CPIT (2)	4.9	0.7	0.9	1.2	2.8	3.1	3.4

Appendix 3: Useful Websites

Arts Centre - www.artscentre.org.nz
Bus Interchange - www.ccdugovt.nz/what-we-are-doing/bus-interchange
Canterbury District Health Board - www.cdhb.govt.nz
Canterbury Museum - www.canterburymuseum.com
Central Christchurch Development Unit - www.ccdugovt.nz
Central City Recovery Plan - www.ccdugovt.nz/the-plan
Central Library <http://www.ccdugovt.nz/what-we-are-doing/central-library>
Christchurch Agency for Energy - www.cafe.gen.nz
Christchurch City Holdings Ltd - www.cchl.co.nz
Christchurch City Council - www.ccc.govt.nz
Christchurch Polytechnic Institute of Technology - www.cpit.ac.nz
Convention Centre Precinct - www.ccdugovt.nz/what-we-are-doing/convention-centre-precinct
Dunedin Energy Centre - www.energyforindustry.co.nz/experience/dunedin-energy-centre/
Energy Efficiency and Conservation Authority - www.eeca.govt.nz
Environment Canterbury - www.ecan.govt.nz
Government Electronic Tenders Service - www.gets.govt.nz
GNS Science - www.gns.cri.nz
Health Precinct - www.ccdugovt.nz/what-we-are-doing/health-precinct
Innovation Precinct - www.ccdugovt.nz/what-we-are-doing/innovation-precinct
Justice Precinct - www.justice.govt.nz/justice-sector/christchurch-precinct
Metro Sports www.ccdugovt.nz/what-we-are-doing/metro-sports-facility
Ngāi Tahu - www.ngaitahu.iwi.nz
Performing Arts Precinct - www.ccdugovt.nz/what-we-are-doing/performing-arts-precinct
Retail Precinct - www.ccdugovt.nz/what-we-are-doing/retail-precinct
SCIRT - www.strongerchristchurch.govt.nz

