

# EcoQUIP

Delivering Efficiency, Quality and Sustainability in Healthcare

## INVITATION TO EXPRESS INTEREST

### **Joint Statements of Demand for Future Energy Solutions for Healthcare**



## Introduction

This Invitation to Express Interest document has been prepared as part of the EU-sponsored EcoQUIP project<sup>1</sup> and in particular its thematic group on 'energy for healthcare'. It is one of several that have been produced in different thematic areas where there is a need for new solutions to address common healthcare challenges.

The objective of this Joint Statements of Demand is to invite ambitious healthcare organisations (i.e. hospitals and healthcare agencies) that **WANT TO BE BETTER** at addressing their future energy-related needs to join us in communicating collective messages of demand for new solutions to the market. Several potential 'Joint Statements of Demand for Future Energy Solutions for Healthcare' have been prepared and are attached to this document. The final versions will include the names of those healthcare organisations that express interest. The remainder of the document provides the context and logic for the proposed joint communication.

## Why Joint Statements of Demand

The main aim of the EcoQUIP project is to demonstrate how to improve the efficiency, quality and sustainability of healthcare through innovation procurement<sup>2</sup>. This alternative approach to procurement (based on specifying desirable outcomes and engaging with the market to present a credible demand for new solutions) has proved to be highly successful at the individual hospital level. There is a growing portfolio of case study evidence and learning materials that are accessible on the EcoQUIP website<sup>3</sup>. Healthcare organisations have the collective power to create a lead market for new environmentally and economically sustainable solutions if they act in a collaborative and organised way to express this demand to potential solution providers. To put this in context, there are over 15,000 hospitals in Europe and they are all facing similar challenges related to efficiency, quality and sustainability.

One way of doing this is by developing **Joint Statements of Demand** for future solutions.

These can then be communicated to potential solution providers (through a process known as 'market sounding') with the aim of creating a dialogue that will result in new solutions becoming available to hospitals or their suppliers. Pre-procurement engagement with the market is the fundamental basis of innovation procurement.

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<sup>1</sup> The EcoQUIP project is a Coordination Action supported by the EU Competitiveness and Innovation Framework Programme (CIP) to support public procurers in purchasing new and improved solutions, products and services in areas of grand societal challenges. EcoQUIP is focussed on the wider application of innovation procurement in the healthcare sector. It involves six hospitals from five European countries along with other stakeholders that have a strong commitment to encouraging innovation and sustainability in the healthcare sector.

<sup>2</sup> 'Innovation Procurement' is a way of buying goods and services that stimulates the supply chain to invest in developing better and more innovative solutions to meet the unmet needs of an organisation

<sup>3</sup> [www.ecoquip.eu](http://www.ecoquip.eu)

*The Buyer/Supplier Paradox*

*There is a common 'Catch-22' that hampers the commercialisation of more environmentally-friendly technologies. This requires new products or services that are not yet commercially available or only available at excessive cost. Because they are not available, customers don't ask for them; and because there is no demand, innovative companies do not invest in bringing new solutions to the market.*

Joint Statements of Demand offer an aggregated means of communicating future needs to the market in a way that demonstrates scale and replicability. They are not about joint procurement but are aimed at convincing innovative businesses that there is a substantial and organised customer demand for new solutions that will address their unmet needs.

This document includes three Statements of Demand for future solutions that have been highlighted either by the hospitals that are participating in the EcoQUIP project or through related European projects such as RES-Hospitals<sup>4</sup> and Energy4Health<sup>5</sup>, namely:

- Low carbon, zero emission energy production systems for hospitals
- Zero net cost energy production systems for community healthcare
- Novel energy storage systems for hospitals

We believe these unmet needs are common to many healthcare delivery organisations across Europe and therefore we invite others to join this EcoQUIP initiative by confirming your interest in supporting the joint communication of unmet needs for future energy solutions.

The purpose of this document is therefore to invite healthcare organisations that are interested in creating market pull for better future energy solutions to join this initiative. It will be used to present Joint Statements of Demand to the energy technology supply chain and there may be subsequent opportunities to participate in collaborative projects.

To express interest in the Joint Statements of Demand please send an email to: [mark.morrison@optimat.co.uk](mailto:mark.morrison@optimat.co.uk) indicating which of the Joint Statements you wish to support. The final version of the documents will include the names of those healthcare delivery organisations that have expressed interest in each of the Joint Statements.

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<sup>4</sup> RES-Hospitals was an Intelligent Energy Europe project aimed at demonstrating how to overcome the barriers to the wider and more strategic use of renewable energy systems in the healthcare sector ([www.res-hospitals.eu](http://www.res-hospitals.eu))

<sup>5</sup> Energy4Health was a EU project aimed at developing a strategic policy roadmap to improve the framework conditions that influence the demand for and market uptake of innovative energy solutions in the healthcare sector (<http://www.ecoquip.eu/about-ecoquip/associated-projects.html>)

The publication of the Joint Statements of Demand will launch a period of consultation with the energy technology supply chain. Through a process of market engagement, we will together call on innovative potential suppliers to propose ways that they can meet our unmet needs.

What this means in practice is that those healthcare organisations that express interest will be listed in the final version of the document that is communicated to the market. As well the supply chain outcomes the expectation is that this initiative may lead to a future collaborative action under Horizon 2020.

## The Power of Collective Action and Leadership

The European healthcare sector is a major energy consumer with infrastructure alone accounting for some 1.6% of total EU energy consumption, which is equivalent to the energy consumption of Portugal<sup>5</sup>. The majority of this energy is produced from fossil fuels, including a significant proportion on hospital sites, and therefore has both a direct impact on local air emissions and an indirect impact on global climate change. If the wider impact of healthcare transport and the supply chain is also taken into account then the overall CO<sub>2</sub> emissions from the European Healthcare sector can be estimated at around 5% of that for the whole of the European Union<sup>6</sup>. This situation is clearly in conflict with the health professional's ethical code of 'primum non nocere' (first, do no harm).

The pressure on the healthcare sector to improve its energy-related performance and self-sufficiency will increase in the future not least because of the economic impact of rising energy prices and the introduction of carbon taxes. Also, the EU has been introducing a progressive series of legislative instruments to support the achievement of its 2020 Climate and Energy targets<sup>7</sup>. At the political level, the Health and Environmental Ministries of the EU Members States made a joint Declaration to "increase the health sector's contribution to reducing greenhouse gas emissions and strengthen its leadership on energy and resource efficient management".

Clearly the healthcare sector should be, and wants to be, a leader in reducing its energy consumption and creating demand for new and improved energy production systems that are sustainable from both an economic and environmental perspective. Why is this not happening?

The European healthcare sector is facing the twin challenges of how to transform its delivery models, to cope with rising demand for healthcare services, at a time of unprecedented economic austerity. The competition for scarce financial resources means that investment in new and more flexible infrastructure is becoming increasingly difficult to justify from capital budgets. In this situation, healthcare organisations need to be more innovative, collaborative and far-sighted about their energy infrastructures from both a technical and financial perspective. The following two examples illustrate what is possible.

***Nottingham University Hospitals NHS Trust in the UK is participating in the EcoQUIP project to explore how the use of innovation procurement methods can produce a better energy infrastructure***

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<sup>6</sup> Low Carbon Buildings in the Healthcare Sector: State of the Art Report, EU LCB-HEALTHCARE project report, April 2011

<sup>7</sup> Reducing the Climate Footprint: The EU's legislative framework and the healthcare sector, Health Care Without Harm, 2015

*solution for its city centre hospital site. It needs to replace its ageing coal powered steam distribution system and also contribute to national 2030 healthcare targets to progressively reduce CO<sub>2</sub> emissions by 50% before 2030. One option was simple replacement with a biomass boiler but, whilst this would have an immediate impact on the CO<sub>2</sub> target, it would too inflexible to cope with the uncertainties of the extensive re-development of the hospital that will be needed to cope with healthcare challenges. The Trust has therefore launched two rounds of pre-procurement market sounding to consult potential suppliers on possible solutions to its future needs. From this, it is clear that it needs to move towards a partially or fully distributed energy model. This decentralised approach is also enabling the Trust to explore novel solutions, such as a hydrogen fuel cell CHP system, through demonstration projects with innovative technology suppliers.*

*In 2008, the board of the **Gundersen Health System** in the United States had become seriously concerned about the rising energy bill for its hospital and over 40 clinics. It therefore decided to embark on a major initiative that was aimed at achieve energy sustainability by 2014 through producing more clean and renewable energy than it consumes from fossil fuel sources (i.e. zero net CO<sub>2</sub> emissions). The first priority was to invest in energy efficiency measures, which helped to fund investment in on-site production of solar energy and capture biogas from a nearby brewery. It then became clear that the constraints of an urban hospital would not allow them to achieve their vision and that further investment would need to be concentrated on where the renewable resources exist. This led to a radical change in strategy, including the establishment of a dedicated unit, to partner with others that could help them achieve their vision. This allowed them to co-invest in offsite wind turbines, a geothermal heat pump installation and biogas production from municipal and dairy waste streams. The outcome is that the Gundersen Health System has achieved its zero carbon target and is now exploring how it can produce more renewable energy than it needs and thus reduce its net energy bill to zero.*

These two examples show what can be achieved with individual leadership but the real opportunity is for the healthcare sector to engage in collective leadership and work in partnership with those in the energy technology sector that can deliver better energy solutions.

This Invitation to Express Interest in Joint Statements of Demand is therefore aimed at hospitals and healthcare agencies that WANT TO BE BETTER and work in a collective way with others that are keen to demonstrate leadership in how to transform the energy systems that provide vital power for healthcare operations.

*At a meeting of the EcoQUIP Thematic Group on Energy for Healthcare in April 2015, it was agreed that the rationale for joint actions should not be about how to respond to energy price or regulatory threats but to help those that “WANT TO BE BETTER” to work collectively to create market demand for innovative future energy systems that are healthcare-ready.*

The following three Statements of Demand are therefore aimed at communicating a ‘direction of travel’ message on what the healthcare sector needs from innovative suppliers. This will not simply be about technological solutions but will also need new financial, service and business models to enable them to be implemented in the healthcare sector.

We hope that other healthcare organisations will be sufficiently motivated to express interest in one or more of the following Joint Statements of Demand. This will be important as a list of potential future buyers that support the communication of the unmet need(s) is essential to convince innovative suppliers that there is a genuine unmet need and commitment to work collaboratively with potential suppliers to help bring innovative new solutions to the market.

Depending on the response, from healthcare organisations and the supply chain, it is likely that there will be opportunities to participate in future collaborative actions under Horizon 2020, either through demonstration projects and/or the new instruments (i.e. PPI/PCP) that are aimed at supporting collaboration between public procurers to address important societal challenges.

## **Joint Statement of Demand No 1**

# **Low carbon, zero emission energy production systems for hospitals**

## **Context**

Many hospitals face unprecedented challenges associated with rising energy costs, the pricing of carbon and the need for flexible infrastructure to cope with changing healthcare demands. In addition, there is increasing evidence of the local impacts of poor air quality on human health and the wider health problems associated with climate change. These health impacts are a direct cost to the healthcare sector yet are rarely factored in when making decisions about hospital energy systems.

There are therefore both financial and moral imperatives for the healthcare sector to take a position of leadership in the use of clean energy and to recognise the social and economic costs of poor air quality and climate change in its procurement decisions.

## **Requirement**

Healthcare organisations operate 24/7/365 and have high demand for energy that is clean, efficient and resilient in operation. An optimum solution is one that has the following outcomes:

- cost effective (based on total cost of ownership)
- reliable and resilient in operation
- flexible in use - to meet variable demand efficiently
- flexible in siting – low noise, low vibration, small footprint
- future ready - adaptable to the changing needs of the hospital estate, climate etc.
- low maintenance with minimal down time
- high energy efficiency
- low operational and embedded carbon
- ultra low emission - minimal emissions of greenhouse gases and other atmospheric pollutants i.e. NO<sub>x</sub>, particulates and other pollutants detrimental to health
- can be financed from non-capital sources

**Healthcare organisations that have expressed interest in this Joint Statement of Demand include:**

**<list of healthcare organisations>**

## Joint Statement of Demand No 2

# Zero net cost energy production systems for community healthcare systems

### Context

The delivery of healthcare services in Europe is increasing moving from hospital-centric models to community-based systems that include both health and social care services. This creates opportunities for the healthcare sector to take the lead in implementing community scale renewable energy production systems, particularly for heating and cooling. Larger scale systems are more economically feasible and can be sited away from crowded hospital sites. Excess energy can be sold to other consumers thus generating income that can be used to improve healthcare services. An example, from the RES-Hospitals project<sup>4</sup>, was a feasibility study with three hospitals in the Netherlands, which demonstrated that the economic viability threshold for deep geothermal energy production systems was around three times the demand of a typical hospital.

Such community-level energy systems are conceptually appealing but are well outside the comfort zone of a typical healthcare organisation. They require a complex mix of developers, energy systems experts, municipal authorities and financial service organisations. Whilst there are examples of hospitals that are connected to large-scale district heating systems (e.g. in Paris) there does not appear to be any examples of hospital-led developments.

### Requirement

A business and service model, which will enable healthcare organisations to implement community-level energy systems (heating and cooling) that are clean, more economical and capable of generating excess funds for healthcare services.

**Healthcare organisations that have expressed interest in this Joint Statement of Demand include:**

*<list of healthcare organisations>*



## **Joint Statement of Demand No 3**

# **Novel energy storage systems for hospitals**

## **Context**

Hospitals need energy systems that are both reliable and resilient in operation. Many have standby or dual systems in case of failure. Most hospitals generate thermal energy onsite. Combined heat & power (CHP) and even tri-generation systems (including cooling) are becoming more common. In some cases, solar energy is being used to produce electricity and/or hot water. There are even some examples of small wind turbines on hospital sites.

These multiple and intermittent sources of energy increase the energy management challenge for hospitals and open up the possibilities for the exploitation of novel energy storage systems. At present, the typical hospital will use hot water storage tanks as a buffer supply in case of system failure and may also take advantage of electricity prices that have been negotiated at the regional or even national level.

Novel energy storage systems could take hospital energy management to a new level. For example, some district heating system operators are exploring the use of phase change materials as an alternative to buffer storage tanks. Energy storage systems could allow electrical power to be extracted from the grid at lowest cost and/or produce hydrogen from renewable energy.

## **Requirement**

Compact and efficient energy storage systems, which can release thermal energy and/or electricity on demand within a hospital-level energy management system and thus maximise resilience at lowest cost.

**Healthcare organisations that have expressed interest in this Joint Statement of Demand include:**

*<list of healthcare organisations>*