Energy4Health

Monitoring & Evaluation Plan for the Energy4Health Roadmap

March 2015

Introduction

The Energy4Health project is one of six that are being carried out in support of the EU Demand-Side Action Plan. Its aim was to develop a policy roadmap to improve the main factors (framework conditions) that influence the demand for innovative energy solutions in the healthcare sector.

This report is concerned with the specific objective to ***'Prepare a preliminary methodology and indicators to monitor progress in developing and implementing the roadmap'***. It represents the ninth and final Deliverable of the project (D9: Methodology to Monitor Progress).

The Monitoring & Evaluation Plan has been prepared with guidance from SQW and we are grateful for the practical advice that was provided by Robin Brighton and Jonathan Cook.

It commences with an overview of the proposed roadmap[1] and the key stakeholders that we believe need to be involved and/or influenced. It then presents some logic models showing the implementation framework for the Roadmap, the main activities and how these are expected to lead to desirable outputs and outcomes. It also shows the inter-relationship between activities, outputs and outcomes with two case examples that illustrate what is already possible at the micro-level with the right framework conditions. The potential evaluation methodologies that may be used to assess the impact of the Roadmap are considered with respect to existing policy drivers and how the two can be mutually supportive. This leads naturally to the conclusion that a 'theory of change' approach is the most appropriate monitoring & evaluation framework for the Energy4Health Roadmap.

The Energy4Health Roadmap

Key Issues

The roadmap aims to address six key issues that are inhibiting the wider exploitation of innovative energy solutions in the European healthcare sector. These are summarised in the graphic below.

The relative importance of these issues varies widely across the European healthcare sector as there is a complex mix of framework conditions that provide either a favourable or unfavourable situation in a particular country. This can even vary within countries as the structures of the healthcare

[1] Energy4Health: 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, March 2015.

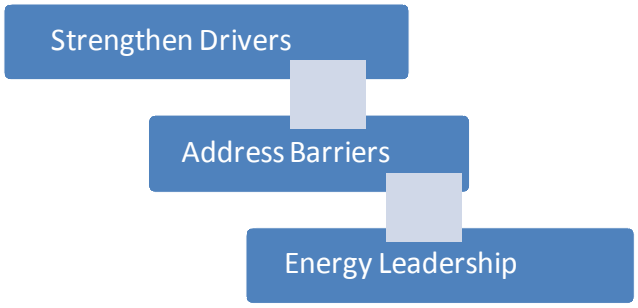
sector are not necessarily centrally governed and there is a trend towards community-based delivery models that are increasingly aligned with social care. Also, the overall situation is extremely turbulent and unstable due to conflicting pressures on public service budgets (because of the continuing economic crisis) and increasing demand for high quality healthcare services (driven mainly by demographics). Unsurprisingly, healthcare sector decision makers generally believe that 'energy' is a relatively low priority for them and this myopic view inhibits the opportunity to be more strategic about transforming energy infrastructures in a way that will both support the healthcare business models of the future and minimise operational costs and negative impacts. In spite of the 'do-no-harm' motto the European healthcare sector is making a significant negative contribution to:

1. EU CO_2 emissions (and the associated global health impacts of climate change),
2. Local air quality (through the direct and indirect use of fossil fuel), and
3. The health of patients and staff (in cases where they are operating 'unhealthy' buildings).

The framework conditions that influence the healthcare sector to support EU 2020 and 2030 energy & climate targets are also quite variable. Some countries have more ambitious targets. Others are slow to implement EU Directives. Incentives also vary hugely and the risk-averse healthcare sector is well behind the leading edge in working collaboratively with the energy technology community to address their future energy infrastructure needs. EU Member States made a joint commitment (at the 5th Ministerial Conference on Environment and Health at Parma in 2010) to "reduce greenhouse gas emissions and strengthen its leadership on energy and resource efficient management". In spite of the 'Parma Declaration', there is no tangible evidence that this policy commitment is being translated into operational/investment practice at the level of healthcare activities. The 6th Ministerial Conference in 2016 may be a timely opportunity to influence high level policy.

Strategic Objectives

The Energy4Health Roadmap is based on three strategic objectives, which together are aimed at achieving a much more sustainable vision in the 2020-2030 period.



Energy4Healthcare VISION 2025

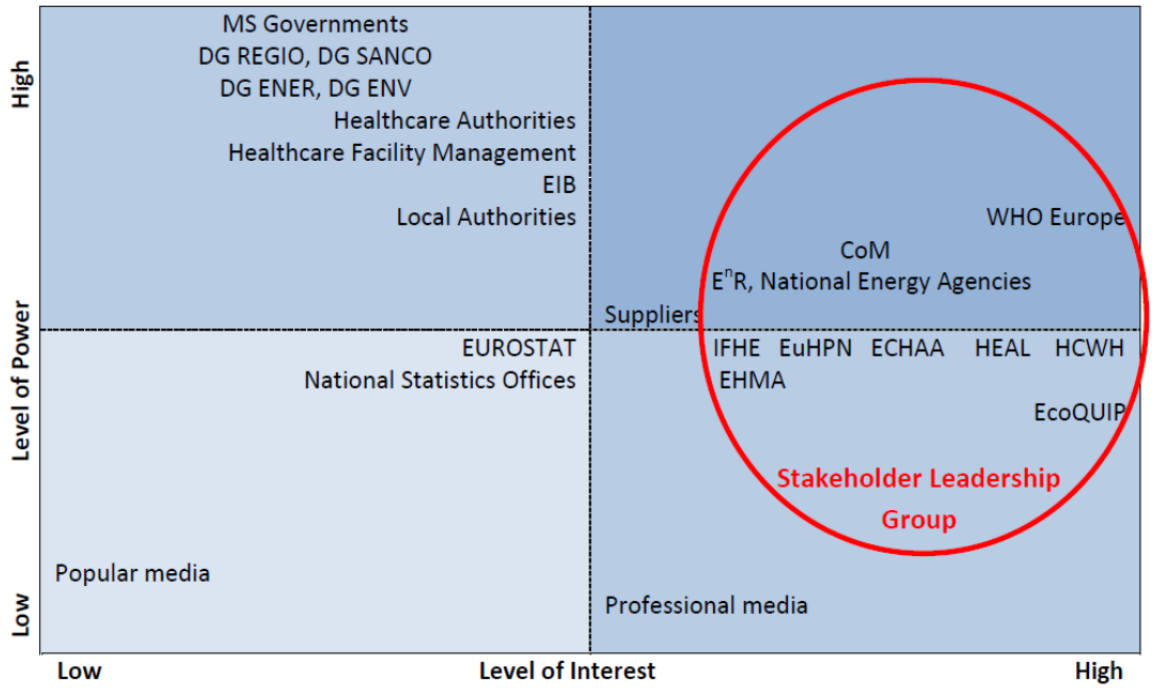
The European healthcare sector has become a global leader in energy efficiency and community renewable energy systems. Many are becoming both carbon and cost neutral. The average cost of energy is less than 1% of healthcare budgets and the sector is well on its way towards reducing its 2050 carbon footprint to less than 20% of 1990 levels.

In order for this vision to be realised, there will be a need to increase the interest and commitment of important stakeholders across the European healthcare sector. This includes the relevant Commission DGs (e.g. for health, energy, environment and regional policy). However, the main

challenge will be to influence the complex hierarchies of national, regional and local organisations that are responsible for healthcare policy and delivery of services.

Implementation

The most logical way to do this is to mobilise those organisations and networks that have the power, commitment and outreach to influence decision makers across Europe. One example is the European Energy Network (E^nR), which is a voluntary network of energy agencies in different countries. Another is the Covenant of Mayors, which is the mainstream European movement involving local and regional authorities, voluntarily committing to increasing energy efficiency and use of renewable energy sources on their territories. These, and others, can be regarded as a potential ***'Stakeholder Leadership Group'*** to support the implementation of the Energy4Health Roadmap as shown below.



Intervention Logic Models

Operational Objectives

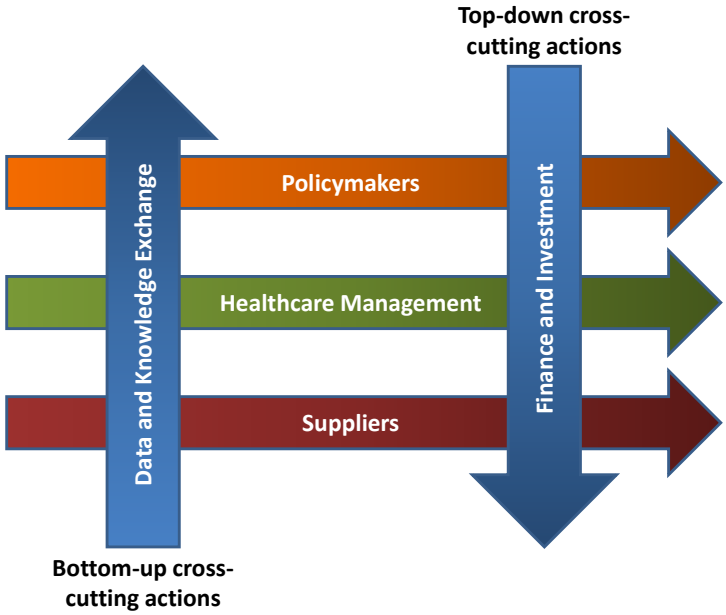
The Energy4Health Roadmap is based on the following eight proposed activities (operational objectives) that are collectively designed to improve the framework conditions that influence the demand for innovative energy solutions in the healthcare sector.

1. Encourage and facilitate the development of sector-level NEEAPs and NREAPs
2. Provide evidence of the scale of fossil fuel use in the European healthcare sector
3. Improve knowledge exchange on sustainable energy management in the healthcare sector
4. Raise awareness of alternative funding options for transformation of energy infrastructures
5. Encourage community and district level partnerships
6. Raise awareness of the link between energy efficiency and patient well-being
7. Develop a European benchmarking database of energy consumption and production
8. Encourage the sustainable energy technology sector to consider the healthcare sector as a lead market for new and improved solutions

These activities, which are the basis for the Roadmap implementation plan, are aimed at influencing three main stakeholder groups (policy makers, healthcare management and energy technology suppliers). They also aim to address two fundamental barriers, namely:

- Finance and investment
- Data and knowledge gaps

These provide the logic for the detailed Energy4Health Roadmap and the associated intervention logic models below.



The way that the Roadmap is expected to influence key stakeholders and address important barriers is shown in the tables below.

Influencing Key Stakeholders

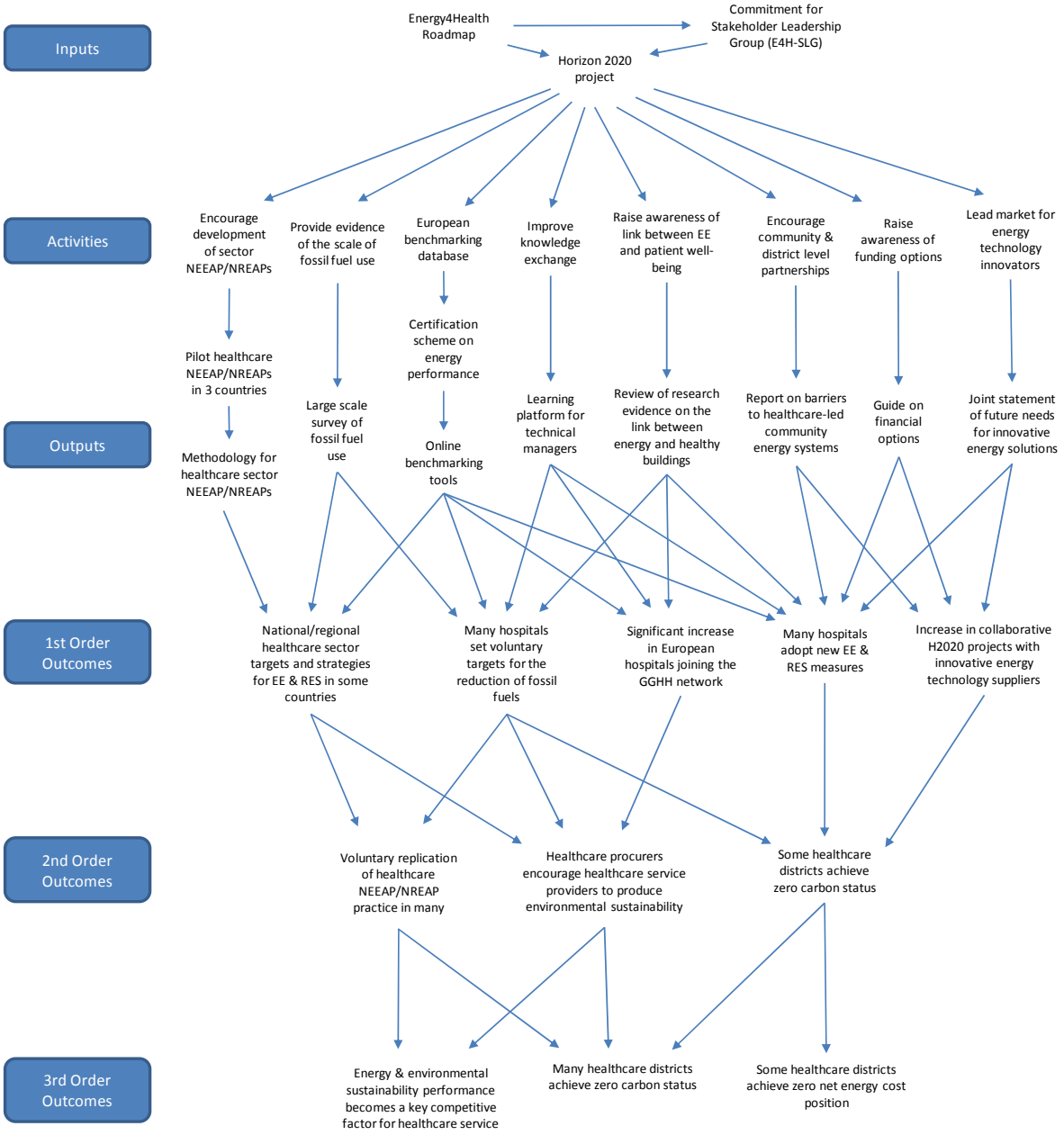
	Start	Journey	Finish
Policymakers	Energy is not seen as a priority area for healthcare. Healthcare sector contribution is not considered in NEEAP & NREAP	Survey on healthcare sector fossil fuel use provides focus for the implementation of the Parma Declaration	Understand the large opportunity for the healthcare sector to contribute to NEEAP & NREAP, the wider economy and skilled workforce
		Support pilot projects to investigate contribution of the healthcare sector to NEEAPs and NREAPs	
		Create policy conditions that target and support healthcare adoption of innovative EE & RES	
Healthcare Management	Energy is seen as an operational, not a strategic issue. Limited knowledge of sustainable energy options or how they could be funded.	Engage with existing and develop new initiatives to improve knowledge of sustainable energy systems amongst management	Recognise the strategic importance of energy decisions and understand the funding and investment mechanisms to implement these.
		Understand the impacts of fossil fuel vs sustainable energy solutions on operational costs and patient well-being	
		Engage with policymakers to identify how framework conditions could be improved to support uptake of innovative energy solutions	
Suppliers	Healthcare sector seen as risk averse to innovation.	Engage with healthcare sector and intermediates (e.g. E^nR) to identify future energy needs that will be required by the healthcare sector as a whole	Recognise the lead market potential of the healthcare sector, the types of solutions that will be required and their replication potential.
		Participate in joint demonstration projects, and feed data into case study and energy performance database	

Addressing Important Barriers

	Start	Journey	Finish
Data and Knowledge Exchange	Limited exchange of energy data and knowledge in the healthcare sector.	Pool existing data, identify best practice data collection and engage necessary stakeholders	Comprehensive data and strong collaboration between facilities and across MS. Replication of best practice.
		Collect data, build case studies (e.g. through new projects) and share knowledge across networks	
		Benchmarking available, best practice recognised through awards/certification	
Finance and Investment	Limited knowledge of financial instruments, barriers to access.	Engagement of policy, and finance stakeholders to identify what barriers might be present to healthcare sector access to funds	Increased number of proposals from healthcare sector for public/private funding for EE & RES improvements.
		Guidebook produced, and policy recommendations made to EC and MS to assist healthcare sector access to finance	
		New partnerships supported between healthcare sector and local communities and with technology suppliers	

Desirable Outcomes

The logic model below shows how the Roadmap can be implemented by the proposed Stakeholder Leadership Group (E4H-SLG) working together under the framework of a Horizon 2020 project with eight main activities (Specific Objectives). This would result in a number of outputs (Deliverables) that could then be expected to lead to a variety of desirable outcomes.



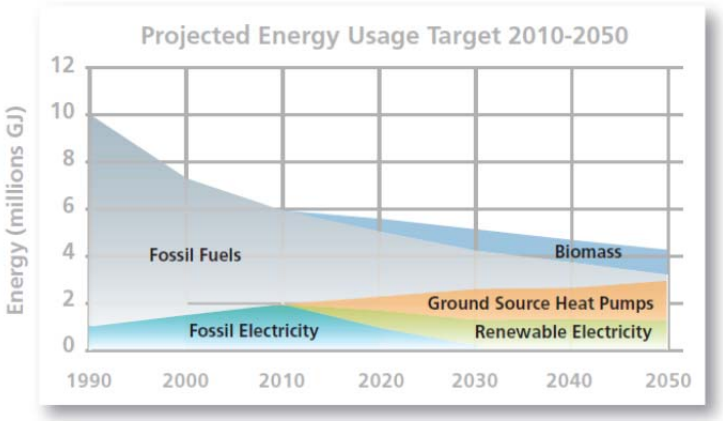
Potential for Impact

The logic model above suggests that a utopian (energy-related) outcome for the European healthcare sector would have two main characteristics:

- Zero carbon healthcare regions or districts
- Zero net energy cost healthcare systems

These may seem a little optimistic but two practical case examples[2] show that these are both possible.

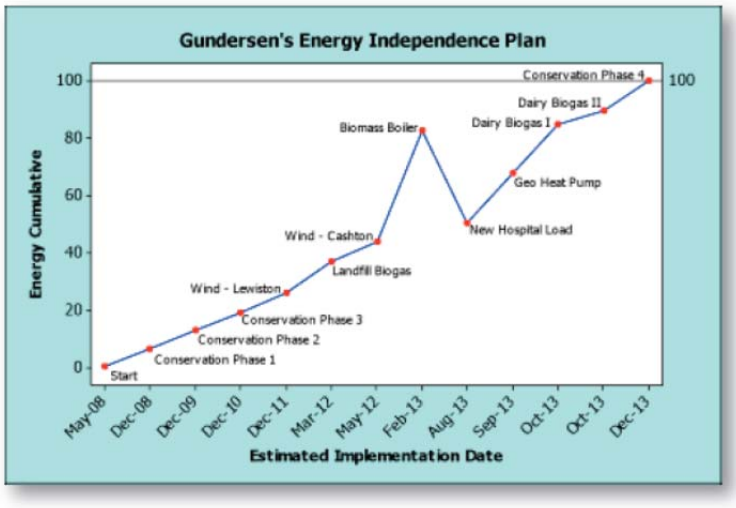
NHSScotland



The Scottish region of the UK is a good example of how ambitious policy targets can drive progressive improvement in energy efficiency and reduction in the use of fossil fuels. The regional health boards under NHSScotland are required to submit regular benchmarking data and demonstrate how they are meeting their annual targets and thus supporting the Devolved Government to meet its longer term target of an 80% reduction in its 1990 greenhouse gas emissions by 2050.

Gundersen Health System (United States)

In 2008, the annual energy bill for the main hospital and 41 clinics of the Gundersen Health System was over $5m per annum and rising at some 7% per annum. The Board then embarked on a radical programme to achieve energy independence by 2014 through producing more clean and renewable energy than it consumes from fossil fuel sources (net zero carbon). This was achieved through a mix of on-site energy conservation measures and off-site investments. Its longer term aim is to achieve a zero net energy cost position by generating more revenue from its renewable sources than it pays as a consumer.

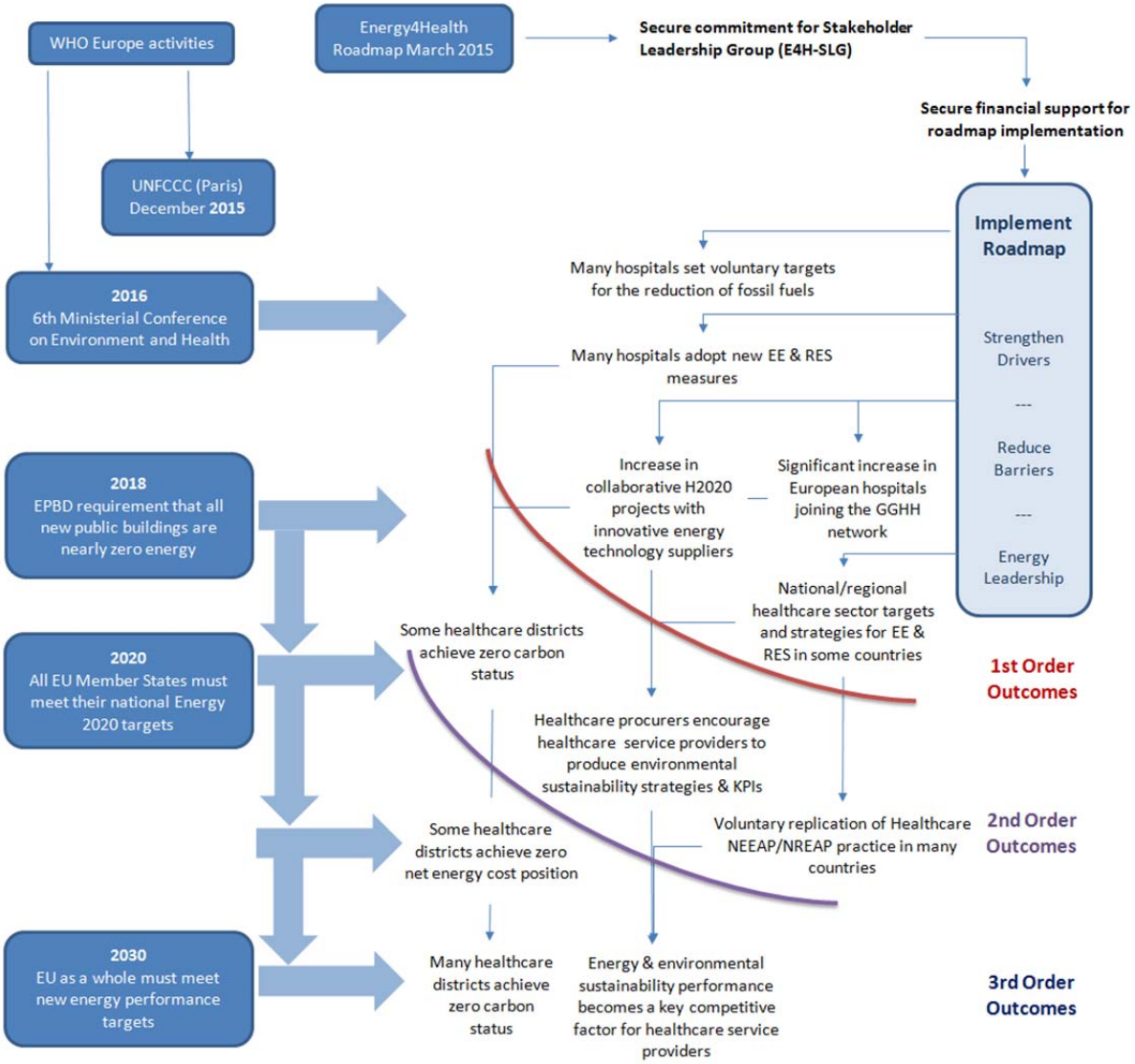


[2] Extracted from the RES-Hospitals 'Renewable Energy Guide for European Hospitals'

Monitoring & Evaluation Framework

Potential evaluation methodologies

The figure below shows the complementarity of some favourable policy trends (e.g. regulations, mandatory targets and policy statements) and the proposed E4H demand side interventions. If these policy drivers (on the left hand side of the figure) were absent it is logical to conclude that the E4H roadmap interventions could still lead to the various outcomes shown, but at a smaller scale and over a longer time period. It could also be argued that the policy trends, whilst favourable, do not yet seem to having the desired effect at the operational level but this could obviously change with or without the interventions that are proposed in the Roadmap.



A complex environment of complementary policies (internal and external to the E4H Roadmap)

This means that the impact of the proposed Roadmap will be difficult to judge given the complex environment of complementary policies. It will therefore be quite difficult to establish a rigorous counterfactual group that would not be exposed to these complementary policy interventions.

These challenges in establishing control and comparison groups are set out in the draft Methodology Paper that was produced as part of the Innovation Demand-Side Monitoring System project[3]. For example, if Member States develop healthcare sector NEEAPs/NREAPs and establish sector specific targets to contribute to national targets then all healthcare facilities are likely to be affected. The methodology paper confirms that *'initial experience of the Roadmaps suggests that implementation of demand-side innovation policies is likely to combine different intervention types.....this combination of measures is likely to be important due to the synergies between actions and the multiple barriers and issues that need to be addressed. This could add some complexity to monitoring and evaluation planning'*. In response to the potential synergies between multiple actions and the challenges in establishing a rigorous counterfactual sample a non-experimental, theory based, evaluation approach is proposed.

Theory of change

The following section describes the underlying logic of how the E4H roadmap activities are expected to contribute to the outcomes shown in the earlier figures. The assumptions behind this logic are described along with the causal pathways and mechanisms explaining the move through inputs and activities to outputs and then outcomes/impacts. The change process could vary depending on the contextual factors present in different Member States and even within different regions in the same country.

The theory of change assumptions behind the three E4H strategic objectives are:

- Increasing healthcare specific drivers for energy efficiency and renewable energy will result in stronger demand for innovative energy solutions than would be the case under current (non sector specific) policies
- Overcoming barriers to the uptake of energy efficiency and renewable energy within healthcare systems will improve contextual factors (framework conditions) and enable mechanisms to function optimally
- Demonstrating energy leadership will highlight the full potential of the European healthcare system to improve environmental and economic performance and convince the supply side to view it as a lead market for new and improved energy solutions

Eight activities (operational objectives) have been proposed to achieve these three strategic objectives. The underlying logic and associated assumptions for these activities are described below, demonstrating the supporting and interlinked nature of the activities with outputs and various outcomes:

1. **Encourage and facilitate the development of sector NEEAPs/NREAPs** – this will lead to raising awareness of the role of the healthcare sector in meeting national energy and climate change targets. By piloting this approach with a small number of Member States this will initially allow those healthcare sectors to establish targets. The presence of these targets will increase government scrutiny and incentive to investment in EE and RES to meet these targets. Methodology and guidance produced as a result of these pilots will be

[3] Ernst & Young et al, WP1: Methodology Paper – Innovation Demand-Side Monitoring System, for the European Commission Enterprise & Industry Directorate-General, January 2015

provided to national health ministries in all other Member States to facilitate further transposition of national energy efficiency and renewable energy targets to healthcare systems. This will result in increased scrutiny and investment in EE and RES. In Member States where the transposition of national targets to healthcare system targets lags behind, there will be a voluntary spill-over effect in these countries as individual and groups of facilities recognise the environmental and economic benefits being demonstrated in other Member States and set their own targets. Furthermore, healthcare procurers will encourage healthcare providers to report on environmental sustainability performance and provide energy efficiency, renewable energy and carbon emissions indicators and KPIs. Where market forces operate within healthcare systems the increasing sustainability credentials of healthcare facilities provide competitive advantage. This will contribute to the emergence of healthcare districts achieving zero carbon status.

2. **Provide evidence of the scale of fossil fuel use in the European healthcare system** – a large scale survey will be carried out to provide robust evidence of the scale of fossil fuel use in the European healthcare system. This will raise awareness amongst policy makers, healthcare managers and clinical staff about the scale of fossil fuel use in European healthcare facilities. This increased awareness will support the development of health sector specific fossil fuel reduction targets (complementary to activity 1, above). Pressure from clinical staff will also lead to voluntary targets being set for the reduction of fossil fuels in individual healthcare facilities and systems. This will increase pressure from healthcare procurers to prefer contracting with facilities with relatively better performance on environmental sustainability. This will, in turn, drive more healthcare facilities to achieve zero carbon status.

3. **Improve knowledge exchange on sustainable energy management in the healthcare sector** – A EU wide knowledge exchange platform will be produced with useful content aimed at healthcare facility technical managers. This will increase the knowledge and capacity of this target group, who are responsible for making the business case for energy efficiency and renewable energy investments. Better information on best practice energy performance levels, investment payback periods, sources of finance, etc., will improve the flow and success rate of energy investment proposals. This will provide healthcare facilities with greater confidence to set voluntary targets on fossil fuel reduction and support any new mandatory energy targets. Increased membership of the existing Global Green and Healthy Hospitals initiative will help facilitate the exchange of knowledge. Improved sustainability performance by healthcare facilities will provide competitive advantage in market based systems. This will support healthcare facilities to achieve zero carbon and net zero cost status.

4. **Raise awareness of alternative funding options for transformation of energy infrastructures** – a guide will be produced on the various financial options available to support investment in energy efficiency and renewable energy systems by healthcare facilities. This will increase the awareness and understanding of the range of public and private sector finance options available to national policy makers (the knowledge of which will reduce barriers to implementing healthcare sector specific targets or facilitating

voluntary targets) and to healthcare management (increasing the volume and quality of investment proposals). This includes an increase in healthcare sector participation in H2020 bids with innovative energy technology suppliers. Following on from this, an increasing number of healthcare facilities and systems will achieve zero carbon and zero net energy cost status.

5. **Encourage community and district level energy partnerships** – a report will be developed on the barriers to healthcare led community energy projects. This will increase the awareness of the potential benefits to healthcare and wider systems of this approach and increase collaborative partnerships with technology suppliers in H2020 projects. The activity will also lead to more healthcare facilities leading community energy projects. This will, in turn increase the number of healthcare facilities and systems achieving zero carbon and zero net energy cost status.

6. **Raise awareness of the link between energy efficiency and patient well-being** – a review of evidence linking energy efficiency practices and patient well-being will be carried out. This will incentivise more healthcare facilities to establish voluntary targets in this area that will benefit patients. As an enabling mechanism this will also lead to increased European membership of the Global Green and Healthy Hospitals platform. Healthcare procurers will increasingly encourage healthcare providers to report on environmental sustainability, leading to energy performance being a factor in procurement decisions. In turn this will lead to increasing adoption of energy efficiency measures and renewable energy systems. More healthcare facilities and systems will achieve both zero carbon and zero net cost status as a result.

7. **Develop a European database of energy consumption and production** – building on existing work of stakeholders in this area, a working group will define comparative energy benchmark metrics that can be gathered and used. This will result in the development of an online benchmarking system to enable healthcare facilities to identify the potential scale of improvement. This will support the development of more robust energy efficiency and renewable energy investment proposals. Scrutiny by healthcare managers of energy performance will increase and this will drive increased participation in the Green and Healthy Hospitals initiative as a focal point to improve performance and eventual increased investment in energy efficiency and renewable energy systems. Better performing healthcare systems will be publicly recognised via a newly developed certification scheme on energy performance. This will allow healthcare procurers to differentiate between better and poorer performing providers which will increasingly influence the procurement process. Healthcare procurers will increasingly demand improvements in energy efficiency on seeing the potential for environmental and economic improvement. Energy efficiency performance will increasingly be seen as a source of competitive advantage. This will in turn, continue to more healthcare systems achieving zero carbon and zero net energy cost status.

8. **Encourage the sustainable energy technology sector to consider the healthcare sector as a lead market for new and improved solutions** – case studies of existing solutions will be developed and the potential for replication evaluated. A statement of future needs for

innovative energy solutions will be developed with technology suppliers. This will result in an increase in healthcare facility participation in H2020 projects with technology suppliers to address future needs. Replication of existing solutions will increase the uptake of energy efficiency and renewable energy solutions by European healthcare facilities. Both of these outcomes will lead to an increase in the number of healthcare systems achieving zero carbon and zero net energy cost status.

Based on the theory of change described for each of the above activities a monitoring and evaluation plan has been developed. This is described below in the form of separate tables for each activity. The logic and assumptions are tested through answering a series of questions that form a mix of process and impact evaluation. These provide for a number of different qualitative and quantitative indicators. A range of research methods are used including surveys of stakeholders, one to one interviews, observation and case study development.

Qualitative and Quantitative Indicators

For each of the eight main activities (operational objectives) a set of indicators can be proposed along with the research method(s) for monitoring and evaluations. These are presented in the tables below.

Activity No 1: Encourage and facilitate the development of sector-level NEEAPs and NREAPs	Monitoring and evaluation research method
1.1 Are stakeholders more aware of the role the healthcare sector can play in meeting national energy and climate change targets?	Survey of stakeholders
1.2 Are healthcare sector specific targets set in Member States where pilots take place (number of member states/regions establishing targets as a result of the pilot)?	One to one interviews and observation
1.3 Has government scrutiny over the health sector performance in energy efficiency and renewable energy increased in member states where pilots take place?	Survey of stakeholders
1.4 Do healthcare sector stakeholders perceive an increase in incentive to invest in energy efficiency and renewable energy in member states where pilots take place?	Survey of stakeholders
1.5 Has methodology and guidance for other member states been produced as a result of these pilots?	Observation
1.6 Has this methodology and guidance been used in other member states to establish formal healthcare sector targets (number of member states/regions using methodology and guidance to set formal targets)?	One to one interviews and case studies
1.7 Has the methodology and guidance been used in a voluntary basis within member states where formal healthcare sector targets have not been set (number of member states/regions using methodology and guidance to set voluntary targets)?	Survey of stakeholders and case studies
1.8 Are healthcare procurers encouraging healthcare facilities and systems to report environmental sustainability indicators and KPIs and what influence have formal and voluntary healthcare specific targets had in this (number of healthcare procurers encouraging sustainability reporting where the presence of mandatory or voluntary targets have been an influencing factor)?	Survey of stakeholders
1.9 Is energy efficiency and renewable energy performance being used by procurers as a factor in the selection of healthcare services, thereby rewarding those that have taken action and what influence have formal and voluntary healthcare specific targets had in this (number of healthcare procurers scoring energy performance in selection process where the presence of mandatory or voluntary targets have been an influencing factor)?	Survey of stakeholders and case studies
1.10 Are healthcare facilities/systems achieving zero carbon status and what influence have formal and voluntary healthcare specific targets had in this (number of healthcare facilities/systems achieving zero carbon status where the presence of mandatory or voluntary targets have been an influencing factor)?	One to one interviews and case studies

Activity No 2: Provide evidence of the scale of fossil fuel use in the European healthcare sector	Monitoring and evaluation research method
2.1 Has a large scale survey been carried out to identify the scale of fossil fuel use in European healthcare systems?	Observation
2.2 Are stakeholders more aware of the scale of fossil fuel use in European healthcare facilities?	Survey of stakeholders
2.3 Has this increased awareness been a factor in the development of formal healthcare sector specific energy efficiency and renewable energy targets?	One to one interviews
2.4 Has this increased awareness been a factor in the development of voluntary healthcare sector specific energy efficiency and renewable energy targets?	One to one interviews
2.5 Are healthcare procurers encouraging healthcare facilities and systems to report environmental sustainability indicators and KPIs and what influence has increased awareness of healthcare system fossil fuel used had in this (number of healthcare procurers encouraging sustainability reporting where increasing awareness of healthcare system fossil fuel use has been an influencing factor)?	Survey of stakeholders
2.6 Is energy efficiency and renewable energy performance being used by procurers as a factor in the selection of healthcare services, thereby rewarding those that have taken action and what influence has increased awareness of healthcare system fossil fuel used had in this (number of healthcare procurers scoring energy performance in selection process where increasing awareness of healthcare system fossil fuel use has been an influencing factor)?	Survey of stakeholders and case studies
2.7 Are healthcare facilities/systems achieving zero carbon status and what influence has increased awareness of healthcare system fossil fuel used had in this (number of healthcare facilities/systems achieving zero carbon status where increased awareness of healthcare system fossil fuel use has been an influencing factor)?	One to one interviews and case studies
2.8 Are healthcare facilities/systems achieving zero net energy cost status and what influence has increased awareness of healthcare system fossil fuel used had in this (number of healthcare facilities/systems achieving zero net energy cost status where increased awareness of healthcare system fossil fuel use has been an influencing factor)?	One to one interviews and case studies

Activity No 3: Improve knowledge exchange on sustainable energy management in the healthcare sector	Monitoring and evaluation research method
3.1 Has an EU wide knowledge exchange platform been produced?	Observation
3.2 Has this increased the knowledge and capacity of healthcare facility technical managers on sustainable energy management?	Survey of stakeholders
3.3 Has using the platform led to an increased flow of energy investment proposals (number of energy related investment proposals where the content on the knowledge exchange platform played a role in their development)?	Survey of stakeholders
3.4 Has using the platform led to an increased success rate of energy investment proposals (number of successful energy related investment proposals where the content on the knowledge exchange platform played a role in their development)?	Survey of stakeholders
3.5 Have mandatory healthcare facility/system energy targets been set and what influence has increased knowledge and capacity of technical managers had on this (number of facilities/systems setting voluntary targets where the knowledge exchange platform has been an influencing factor)?	Survey of stakeholders and case studies
3.6 Have voluntary healthcare facility/system energy targets been set and what influence has increased knowledge and capacity of technical managers had on this (number of facilities/systems setting voluntary targets where the knowledge exchange platform has been an influencing factor)?	Survey of stakeholders and case studies
3.7 Has there been an increase in membership of the Global Green and Health Hospital initiative by European healthcare facilities and what influence has increased knowledge exchange had on this (number of European healthcare facilities registered as members of the GGHH initiative where the knowledge exchange platform has been an influencing factor)?	Observation and survey of stakeholders
3.8 Has improved knowledge and capacity on sustainable energy management led to a competitive advantage for healthcare service providers operating in market conditions?	Survey of stakeholders and case studies
3.9 Are healthcare facilities/systems achieving zero carbon status and what influence has increased knowledge exchange had on this (number of healthcare facilities/systems achieving zero carbon status where the knowledge exchange platform has been an influencing factor)?	One to one interviews and case studies
3.10 Are healthcare facilities/systems achieving zero net energy cost status and what influence has increased knowledge exchange had on this (number of healthcare facilities/systems achieving zero net energy cost status where the knowledge exchange platform has been an influencing factor)?	One to one interviews and case studies

Activity No 4: Raise awareness of alternative funding options for transformation of energy infrastructures	Monitoring and evaluation research method
4.1 Has a healthcare specific guide to funding options for energy efficiency and renewable energy systems been produced?	Observation
4.2 Has this guide increased the awareness and understanding of public and private sector finance options available?	Survey of stakeholders
4.3 Has the guide influenced the setting of any mandatory member state or regional healthcare specific mandatory targets on energy efficiency and renewable energy (number of mandatory targets set where the guidance has been an influencing factor)?	Survey of stakeholders and case studies
4.4 Has the guide influenced the setting of any voluntary targets on energy efficiency and renewable energy by healthcare facilities/systems (number of voluntary targets set where the guidance has been an influencing factor)?	Survey of stakeholders and case studies
4.5 Has using the guide led to an increased flow of energy investment proposals (number of energy related investment proposals where the guide was used as an input)?	Survey of stakeholders
4.6 Has using the guide led to an increased success rate of energy investment proposals (number of successful energy related investment proposals where the guide was used as an input)?	Survey of stakeholders
4.7 Has there been an increase in healthcare sector participation in H2020 bids with innovative energy technology suppliers (number of H2020 bids with healthcare stakeholders and energy technology suppliers as partners where the guide has been an influencing factor)?	Survey of stakeholders and observation
4.8 Are healthcare facilities/systems achieving zero carbon status and what influence has increased awareness of finance options via the guide had on this (number of healthcare facilities/systems achieving zero carbon status where the guide has been an influencing factor)?	One to one interviews and case studies
4.9 Are healthcare facilities/systems achieving zero net energy cost status and what influence has increased awareness of finance options via the guide had on this (number of healthcare facilities/systems achieving zero net energy cost status where the guide has been an influencing factor)?	One to one interviews and case studies

Activity No 5: Encourage community and district level energy partnerships	Monitoring and evaluation research method
5.1 Has a report been developed on the barriers to healthcare led community energy projects?	Observation
5.2 Are healthcare stakeholders more aware of the benefits of leading community energy projects as a result of the report?	Survey of stakeholders
5.3 Has there been an increase in H2020 proposals with healthcare stakeholders partnering with energy technology suppliers on community energy projects and what has been the influence of the reporting activity (number of H2020 bids with healthcare stakeholders and energy technology suppliers as partners with community energy systems being the focus, where the report has been an influencing factor)?	Survey of stakeholders and observation
5.4 Are more healthcare facilities taking the lead on community/district energy projects and has the report influenced this (number of community/district energy system projects where healthcare facilities have taken the lead and the report has been an influencing factor)?	Survey of stakeholders and case studies
5.5 Are healthcare facilities/systems achieving zero carbon status through a contribution from leading community/district energy systems and what influence has increased awareness of the benefits of this approach, via the report, had on this (number of healthcare facilities/systems achieving zero carbon status where the report has been an influencing factor)?	One to one interviews and case studies
5.6 Are healthcare facilities/systems achieving zero net energy cost status through a contribution from leading community/district energy systems and what influence has increased awareness of the benefits of this approach, via the report, had on this (number of healthcare facilities/systems achieving zero net energy cost status where the report has been an influencing factor)?	One to one interviews and case studies

Activity No 6: Raise awareness of the link between energy efficiency and patient well-being	Monitoring and evaluation research method
6.1 Has a review of evidence linking energy efficiency practices and patient well-being been carried out?	Observation
6.2 Are more healthcare facilities establishing voluntary energy efficiency targets as a result of this review (number of healthcare facilities establishing voluntary energy efficiency targets where the review linking this to patient well-being has been an influencing factor)?	Survey of stakeholders and case studies
6.3 Have more healthcare facilities become members of the Global Green and Healthy Hospitals initiative as a means to supporting their energy efficiency goals (number of healthcare facilities joining GGHH initiative where the review has been an influencing factor in this decision)?	Observation and survey of stakeholders
6.4 Are more healthcare procurers encouraging healthcare facilities to report on environmental sustainability performance and what has been the influence of the review linking energy efficiency and patient well-being (number of healthcare procurers encouraging healthcare providers to report on environmental sustainability where the review has been an influencing factor)?	Survey of stakeholders
6.5 Are healthcare procurers taking energy efficiency performance into account when selecting healthcare providers and what has been the influence of the review linking energy efficiency and patient well-being (number of healthcare procurers using energy efficiency as part of their selection of healthcare providers where this has been influenced by the review)?	Survey of stakeholders and case studies
6.6 Has adoption of energy efficiency measures increased and what influence has the review had on this (number of healthcare facilities adopting energy efficiency where this has been influenced by the review)?	Survey of stakeholders and case studies
6.7 Are healthcare facilities/systems achieving zero carbon status through energy efficiency measures and what influence has the review linking energy efficiency and patient well-being had on this (number of healthcare facilities/systems achieving zero carbon status where the review has been an influencing factor)?	One to one interviews and case studies
6.8 Are healthcare facilities/systems achieving zero net energy cost status through energy efficiency measures and what influence has the review linking energy efficiency and patient well-being had on this (number of healthcare facilities/systems achieving zero net energy cost status where the review has been an influencing factor)?	One to one interviews and case studies

Activity No 7: Develop a European benchmarking database of energy consumption and production	Monitoring and evaluation research method
7.1 Have comparative energy benchmark metrics been defined and agreed by a stakeholder working group?	Observation
7.2 Has an online benchmarking system been established as a result of this to enable healthcare facilities to identify the potential scale of improvements?	Observation
7.3 Have more robust energy efficiency and renewable energy investment plans being developed and what has been the influence of the benchmarking system in this?	Survey of stakeholders
7.4 Are healthcare managers more aware and motivated to take action to improve energy performance and what has been the influence of the benchmarking system in this?	Survey of stakeholders
7.5 Are more European healthcare facilities becoming members of the Global Green and Healthy Hospitals initiative and what is the influence of the benchmarking in this decision (number of healthcare facilities joining the GGHH initiative where the benchmarking system has been an influencing factor)?	Survey of stakeholders
7.6 Has a new certification scheme to recognise good performance in energy efficiency and renewable energy in the healthcare sector been developed that is linked to the benchmarking system?	Observation
7.7 Do public and private healthcare procurers use this certification scheme as part of their decision making process in selecting healthcare providers (number of healthcare procurers using the certification scheme as a factor in awarding contracts)?	Survey of stakeholders and case studies
7.8 Has adoption of energy efficiency measures and renewable energy systems increased and what influence has the benchmarking system and certification scheme had on this (number of healthcare facilities adopting energy efficiency measures and renewable energy systems where this has been influenced by the benchmarking system and certification scheme)?	Survey of stakeholders and case studies
7.9 Are healthcare facilities/systems achieving zero carbon status through energy efficiency measures and renewable energy systems and what influence have the benchmarking system and certification scheme had on this (number of healthcare facilities/systems achieving zero carbon status where the benchmarking system and/or certification scheme have been influencing factors)?	One to one interviews and case studies
7.10 Are healthcare facilities/systems achieving zero net energy cost status through energy efficiency measures and renewable energy systems and what influence have the benchmarking system and certification scheme had on this (number of healthcare facilities/systems achieving zero net energy cost status where the benchmarking system and/or certification scheme have been influencing factors)?	One to one interviews and case studies

Activity No 8: Encourage the sustainable energy technology sector to consider the healthcare sector as a lead market for new and improved solutions	Monitoring and evaluation research method
8.1 Have case studies of existing solutions been developed and the potential for replication evaluated?	Observation
8.2 Has a statement of future needs for innovative energy solutions been developed between healthcare sector stakeholders and energy technology suppliers?	Observation
8.3 Has there been an increase in healthcare facility participation in H2020 projects along with energy technology suppliers to address the future needs identified (number of successful H2020 projects between healthcare facilities and energy technology suppliers where the statement of future needs has been an influencing factor)?	Survey of stakeholders, observation and case studies
8.4 Has replication of existing energy efficiency and renewable energy solutions increased (number of healthcare facilities adopting existing energy efficiency and/or renewable energy solutions where this has been influenced by the case studies)?	Survey of stakeholders
8.5 Are healthcare facilities/systems achieving zero carbon status through energy efficiency measures and renewable energy systems and what influence has the replication case studies and joint statement of unmet need had on this (number of healthcare facilities/systems achieving zero carbon status where the case studies and/or unmet need statement have been influencing factors)?	One to one interviews and case studies
8.6 Are healthcare facilities/systems achieving zero net energy cost status through energy efficiency measures and renewable energy systems and what influence has the replication case studies and joint statement of unmet need had on this (number of healthcare facilities/systems achieving zero net energy cost status where the case studies and/or unmet need statement have been influencing factors)?	One to one interviews and case studies