

Author: Jeonghwa Yi  
University of Cambridge



## ESIA for a housing project in England

Land use for housing development in North West Cambridge

Type of impact assessment	Environmental (and Social) Impact Assessment (ESIA)
Type of project/plan	Land Use Project (housing development)
Climate change related issues	Lower annual rainfall, higher winter rainfall, intense storms, summertime overheating, water conservation
Influence of the ESIA	Rainwater capture and recycling scheme for water conservation; project design based on ESIA outcomes

The ESIA for this housing project was supplemented with a carbon reduction strategy and sustainability assessment. The ESIA identified climate change adaptation and mitigation measures. A rainwater capture and recycling scheme was selected as the most feasible alternative for water conservation.

### Climate change in the area

The *North West Cambridge (NWC) development* involves building of

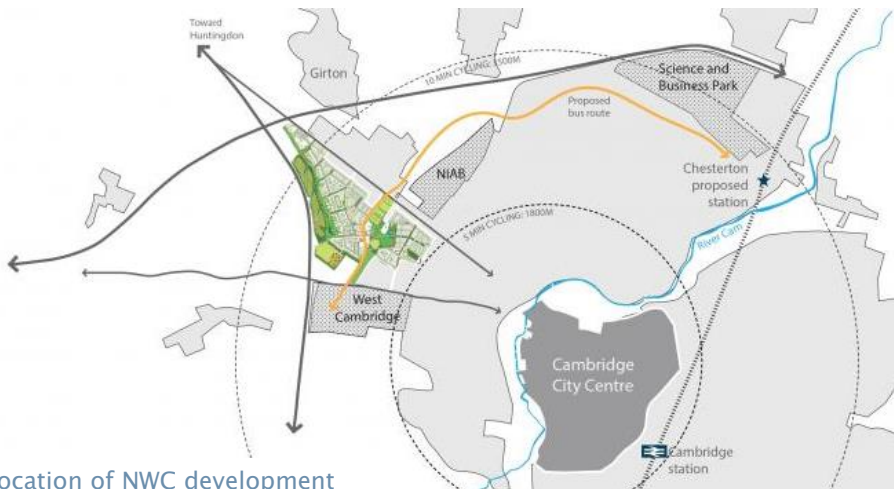
1,500 homes for University workers, 1,500 homes for sale, accommodation for 2,000 students and a wide

range of community facilities on the 150 hectare site. This project has been brought forward by the University of Cambridge to create the highest standards of environmental sustainability and is designed to minimise carbon emissions. Climate change impacts such as droughts, higher temperatures, and more frequent intense weather events may also affect the development area. There are two major reasons why the project took a more climate smart planning direction. First, the local authority, Cambridge City Council, has moved forward its policy on climate change by setting a strong target with regard to the building code. Second, the land ownership strongly supported a climate smart approach. The project has been

promoted by the University as a 'model' for sustainable living which will be an exemplar new settlement, meeting the University's future research and accommodation needs and enhancing the local area.

### Assessing climate change risks for the housing project

In identifying likely climate change impacts, the assessment has been largely guided by the fifth generation of climate information for the UK, UKCP09 data. Moreover, current meteorological data on rainfall, temperature and wind speed were used. A number of recommendations concerning design, construction and operational requirements based on the assumptions were suggested. As an example, current and historical



Location of NWC development

rainfall data from the Meteorological Office's standard 5 km grid point data set was used to predict average annual rainfall events for the cross-site over a maximum 100 year return period including predicted impacts of climate change.

Detailed climate change information was not outlined in the main ESIA report but in supplementary documents such as a Carbon Reduction Strategy and Sustainability Assessment. The ESIA indicated that the NWC development will "actively engage in design that accommodates the potential effects of climate change through adaptation strategies, and design so as to mitigate as far as reasonable the potential adverse effects of the proposed development on climate change." A Climate Change Adaptation Strategy was prepared parallel with the ESIA.

### Climate smart adaptation and mitigation in the ESIA

In the ESIA, along with adopting Sustainable Drainage Systems (SUDs), extensive green infrastructure and open spaces were suggested to reduce flood risk and improve water management. It also highlights principles to combat thermal dis-

comfort in buildings. Some examples are: careful control of solar gains; designs to incorporate openings for purge ventilation in summer; and overheating studies which consider the impacts of thermal mass in living areas and kitchens.

Four water conservation scenarios were developed and their performance modelled against predicted future rainfall: 1) business as usual; 2) a site-wide rainwater capture and recycling scheme; 3) a site-wide rainwater-to-potable scheme; and 4) a blackwater-to-nonpotable scheme. A feasibility study concludes that scenario 2 has the lowest risk and the highest chance of successful implementation. Voluntary actions will also be taken for the new buildings, including Code for Sustainable Homes (CSH) level 5 for all dwellings (the largest development known at this level), and BREEAM Excellent for all non-domestic buildings.

Overall, the ESIA identified how engineering design and operation of project components can be adapted to climate change impacts, rather than focusing on impacts of the project on biophysical environments.

## Conclusion: Climate smart design of the project

The ESIA provided an overview of climate change impacts associated with the proposed project in NWC.

Throughout the NWC project, there has been a close link between the adaptation study team and the master planning design team, which has ensured that results and initial ideas coming from the ESIA have been fed into the design directly. Further, the timing of the adaptation project has coincided well with the detailed design stage of the project.

In fact, a large number of design elements, in particular the design of mechanical and electrical services and building structures, make extensive use of design codes and compliance guides. The ESIA also acknowledged this point by stressing that these codes and guides should incorporate adaptation issues and design factors for adaptation to be effectively included in projects.

## References

Dobson et al., North West Cambridge, Environmental Statement, Cambridge City Council and South Cambridgeshire District Council, Cambridge (UK), 2012.

Henderson et al., North West Cambridge, Climate Change Adaptation Strategy, City Council and South Cambridgeshire District Council, Cambridge (UK), 2013.

## Characteristics of climate smart(er) project:

- Three-step approach applied ✓
- Climate smart(er) project design ✓
- ESIA increased commitment for project ✓

## Climate smart(er) because:

- Green infrastructure and open spaces suggested to reduce flood risk and improve water management.
- Site wide rainwater capture and recycling scheme.
- Adaptation measures will be taken for all dwellings.