

OASIS+

Open access catastrophe modelling
driving adaptation to enable resilience
in an uncertain future



Oasis+ business plan:
Executive summary



VISION

‘to become one of Europe’s leading providers of softwares, tools, services and models that will enable catastrophe and climate risk assessment and adaptation planning by public, finance and other private sector organisations and create greater resilience against future catastrophes and climate impacts.’

Oasis+ is a Pan-European umbrella initiative run through a consortium of academic, research and not-for-profit organisations and businesses. Under this umbrella a range of models, tools, new businesses and services are being developed that will enable and act as catalysts for increased societal use of evidenced-based climate and catastrophic risk assessment and climate adaptation planning tools.

Our focus lies in creating new markets around climate and catastrophe (CAT) models, tools and services for:

- The Insurance sector
- Cities and public services
- Emerging and developing economies (data-poor regions)
- Industry
- Individuals

We will stimulate a market place for new model creation to ensure users from all sectors are able to obtain catastrophe (CAT) and climate change models for risk assessment, adaptation planning and decision-making. This will challenge and stimulate the understanding, representation and communication of risk and uncertainty in the face of climate change.

Our five strategic tools will be:

1. Oasis Loss Modelling Framework, a world leading standard for open source software that assists and supports the understanding and calculation of damage and financial risk in the face of catastrophes

2. Oasis eMarket (*commercial name of site to be decided*) – linking demand to supply
3. Sector specific demonstrators that will test and innovate our tools and further co-design specific and appropriate models, entry points and new tools that provide data and data visualisation in appropriate formats
4. The Oasis Consortium will inspire a growing international network of modellers and modelling businesses and related services that have the technical skills and awareness of the necessary standards to produce high quality CAT models to fulfil the needs of the wider market place
5. An education environment that increases the skills needed for commercial and societal CAT and climate adaptation modelling and use and that encourages innovation and entrepreneurship within the Oasis+ ecosystem. Oasis Palmtree will also develop on-line educational MOOC’s for modellers and model users - encouraging a broader range of people able to develop and use models.

Oasis+ is a Climate-KIC supported initiative.

Our partners are:

- The Oasis+ Consortium – a Pan-European, public-private consortium of universities, research institutes and businesses who are working together to create new models and modelling methodologies and developing businesses and services around these models
- Oasis LMF Ltd (a membership organisation of over 44 major insurers and reinsurers who are actively supporting the growth of new markets producing catastrophe and climate models.)

We seek to attract new partners from:

- Our network of insurers and reinsurers
- Cities – resilience planners
- Industry – risk planners
- Bi-lateral and multi-lateral bodies
- Public health
- Donors and investors working within the climate adaptation area

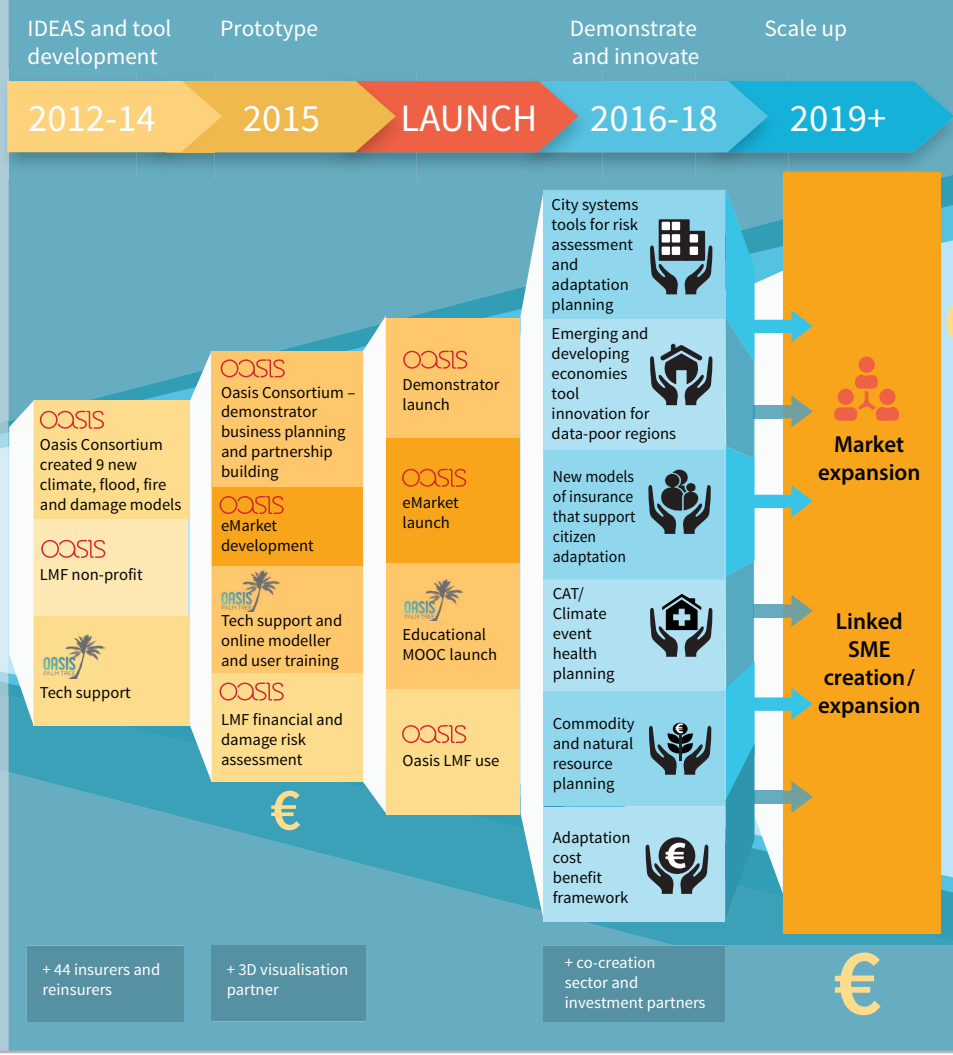
We now seek to build on the achievements of the original Climate-KIC funded Oasis Innovation Project that:

- Capital attracted (3M€ membership fees)
- 2 x sustainable spin out’s created
- Creation of Oasis Loss Modelling Framework
- Creation of nine new climate, flood and forest fire CAT models
- Already generates revenue for partners (240k€)
- Received two industry awards in 2014
- Three PhD’s
- Ten published scientific papers



A society reticent to make adaptation decisions, investments or implementation due to lack of knowledge, understanding and evidence of catastrophe and climate risk

Partnership development



We will act as a catalyst for the innovation of CAT and climate adaptation models by opening a new commercial market place for model developers, where both download and services around licensed models can be gained as well as a novel function, matchmaking demand to supply and model creation.

We also wish to substantially open up the modelling ecosystem beyond the insurance market to local authorities and cities, public services and industry.

We seek to do this through the creation of Demonstrators that act as multi-organisational, multi-disciplinary ecosystems around the understanding and production of models in formats required for different sectors.

Equally, we seek to educate modellers and user groups on the building of and use of CAT and climate adaptation models. This will be achieved through on-line training modules, bringing the users together in large workshops for modellers and users and through training in creating businesses for modellers.

Our aspiration is to become a large ecosystem,

inspiring and acting as a catalyst for 'Adaptation Services'. We wish to more seriously innovate the information, tools and services to enable society to take climate adaptation measures planned around the most accurate information available. This will enable the more accurate targeting of large scale investments required to adapt to climate change and as a result protect people, property and assets.

Market need

It is now broadly understood by the insurance and finance sector that climate change preparedness is a critical component of future business planning. Indeed given insurers intimate knowledge of the damage caused by catastrophic events over the last thirty years they have the information to critically assess recent climate change impacts. Likewise, it is becoming increasingly important for insurers to prepare underwriting levels appropriate for these changes under EU Solvency II.

It is also becoming clear that climate change is already impacting core business operations of these companies. For example, the Allianz Group stated that 35 to 40 percent of insured losses are due to natural catastrophes mainly floods and



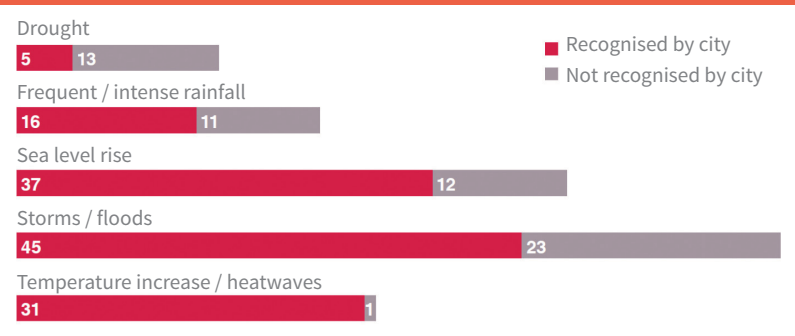
storms (Allianz Group and WWF, 2014). Indeed, the Association of British Insurers suggest that the annual cost of weather claims by 2050 will double to 3.3 billion euros and in an extreme year up to 20 billion euros. In Germany, flood damage in just one event will be up to 15 billion euros. Property damage is likely to increase up to 2 to 4 percent per year (Allianz Group and WWF, 2014).

Oasis has conducted a market scan of products and CAT modelling companies currently on the market. Four main companies dominate this market and have accumulated the majority market share. The models tend to be very large-scale models and are sold with licenses in the region of US\$ 1 million per model. These prohibitively high costs act as a barrier to other sectors using these models. These companies also offer a ‘black box’ service where little transparency on model assumptions has caused a lack of comparability of models by the insurance sector. Oasis intends to disrupt this closed market and open up the modelling sector to local governments and industry by reducing the costs of obtaining high quality models developed specifically for different sectorial need.

What should be made clear is that the standards of modelling set by the insurance sector for CAT risk modelling are likely to meet most of the expectations required by global cities who wish to develop their adaptation strategies. However, currently there is little understanding within sectors outside the Insurance sector on why the use of these types of quality models would benefit industry and local government more broadly. They instead currently opt for models from different consultancies on a case-by-case basis and are unlikely to include accepted damage data, comparability and quality standards. In the European Commissions ‘Adaptation strategies for European cities’ (2002) the report points out that ‘while detailed information on projected climate hazards is available on a Pan-European scale, city-scale climate hazard data is sporadic, and where it does exist for European cities it tends to be the product of either a research enquiry or a municipal process’. Thus those models adapted for the insurance market fulfil physical climate risk and vulnerability and have an additional element, of the potential financial cost of CAT losses. This final measure would help cities to cost/benefit proposed adaptation measures and would provide greater leverage through the political and investment processes, enabling adaptation measures to be implemented.

Connected to the need for more localised data is also the link between cities and industries. In a recent report ‘Protecting our capital: How climate adaptation in cities creates a resilient place for business’ (for CDP by AECOM, 2014) the report highlights the awareness of businesses around the risks that they have recognised in cities that will affect their business model (Figure 1).

Figure 1: Risks reported by companies and recognised by cities



(Protecting Our Capital, for CDP by AECOM, 2014)



The Oasis Consortium has modelling skills in all of these areas. Beyond cities the need for open access catastrophe models is equally apparent. If one looks at food staples and commodity supply chain risks more localised catastrophe modelling is essential.

Oasis is proposing developing a systems based approach to urban adaptation impact monitoring system that assist sectors beyond insurance to understand their CAT and climate adaptation risk.

Our commercialisation strategy

Our commercialisation strategy is based around two key tools:

Oasis+ eMarket (*commercial name of site to be decided*) – a commercial vehicle for sales of models, tools and services and linking users with model developers and suppliers – **this is a commission based limited company** that acts as a catalyst for creating a market for modelling organisations and connecting demand-side users to the range of CAT and climate models and services available. Complementary income streams will also be based around advertising with jobs and announcements. Advertising will also include climate adaptation and resilience products and services.

Two main eMarket segments have been identified (**Figure 2**).

Figure 2: eMarket segments

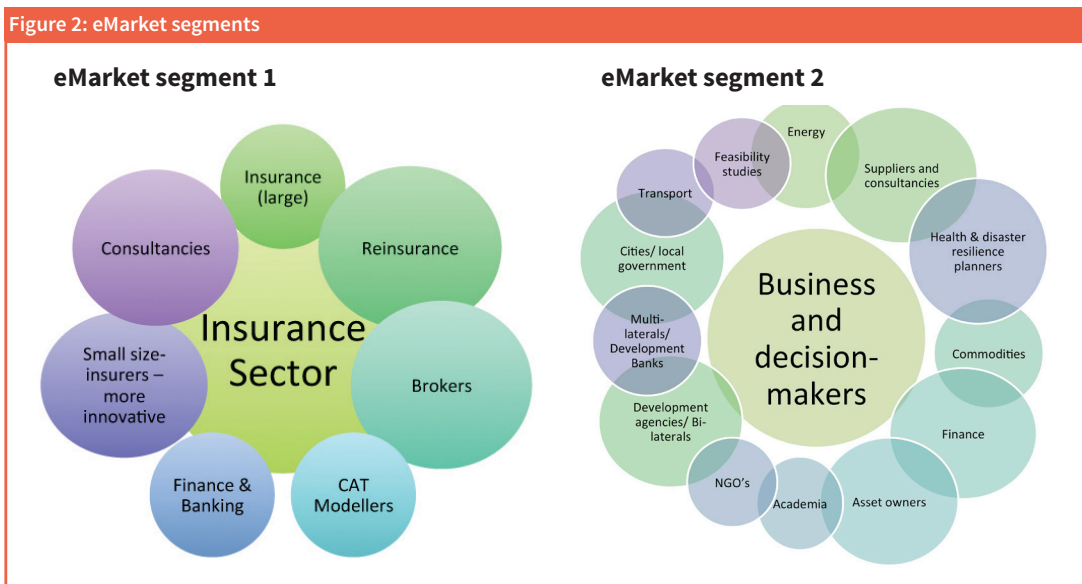


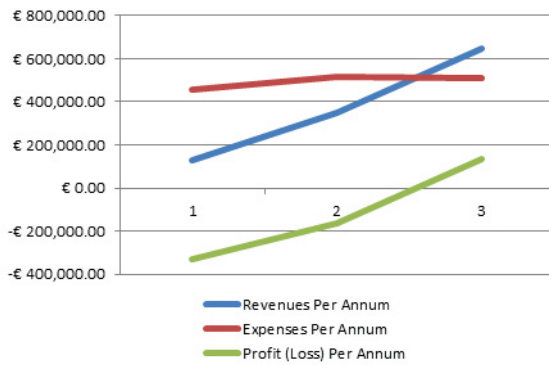
Figure 3: Oasis+ eMarket

2016-2018 Forecast and Budget Summary

(in Euros)	2016	2017	2018
Revenues per annum	€ 129,150.00	€349,050.00	€646,350.00
Expenses per annum	€457,570.00	€515,070.00	€510,870.00
Profit (Loss) per annum	-€328,420.00	-€166,020.00	€135,480.00
Minimum investment required	€500,00.00		

Revenues created into eMarket for Ecosystem of Partners Providers

€1,095,000.00 €2,898,000.00 €5,475,000.00



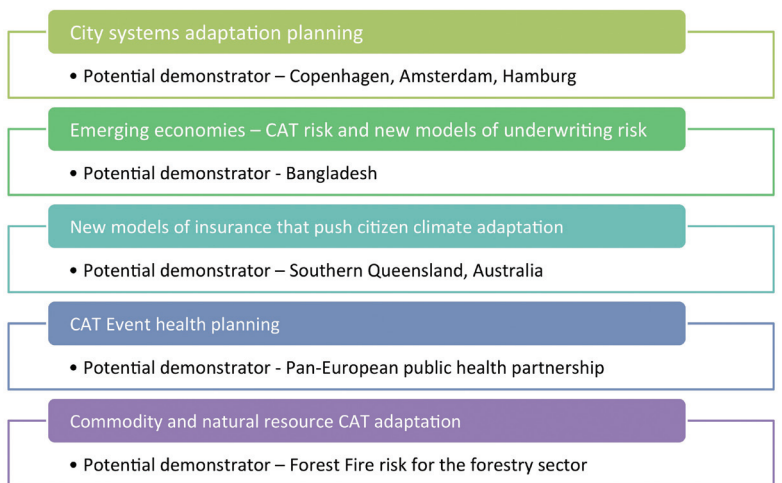
The eMarket will take differing approaches to these customer segments, the insurance sector being a mature market for CAT models and the planning and adaptation segment, a new market that will require more education around the use of models.

A venture forecast has been conducted and a full spreadsheet is available with our full business plan. A summary is shown in the graph below. It is envisaged the eMarket will move into profit in the third year and that the wider benefits to external modelling businesses will be significant (see **Figure 3**).

Sectorial demonstrators

The demonstrators tackle the issue of market creation and awareness of CAT and climate models and tools. They assist in the understanding of models and model use through co-creation of models with demand side stakeholders (e.g. cities, insurance companies, governments and industry etc.). Models developed under the demonstrators will then be loaded into the eMarket to be sold to the open market under licenses. Partnership and co-creation of models and tools between demand side users, investors and modellers will be a main focus of the demonstrators and learnings and innovations will be distributed among the wider sector to increase market awareness and understanding of CAT and climate model potential uses (see **Figure 4**).

Figure 4: Demonstrator areas



Education

While the knowledge of atmospheric science and climate change rests within the academic community, the specific knowledge of how to turn this data into a catastrophe model is only found in a few specialists around the world.

Massive open online courses (MOOCs)

The proposed course will be developed by Oasis Palmtree and freely available online, in perpetuity, to a global audience, and directed in particular at either those wishing to turn climate data into a CAT model or wishing to understand how to use cat models. It will be designed using feedback from other KIC partners and based on modules in six key categories:

1. How Oasis software works and how to make modules compatible
2. How to construct hazard modules
3. How to construct vulnerability modules
4. Ways to use catastrophe modules in adaptation
5. How to use output from these models

Content will be presented in a range of formats including video, short articles and quizzes, which will be designed and developed using a storyboard approach as per diagram below

Modelling community workshops

Oasis+ will organise at least two large workshops around the following topics:

- i Creating CAT and climate adaptation models using accepted industry standards
- ii Using CAT and climate adaptation models – a workshop for planners

Creating businesses around CAT and climate adaptation modelling

A series of training courses will be run for modellers linked to Climate-KIC education and entrepreneurship programmes that increase the skills in science graduates in understanding how to bring a business venture based around modelling to market. We will use existing successful formats of business planning and associated commercial skills to populate these short courses.

Oasis+ 'partner' business planning

Although some of the partners in the Oasis+ Consortium are already established businesses some of the partners are attached to academic and public research organisations and have access to multiple models and model making expertise across the organisation. Therefore, we would like to encourage those partners to:

1. Develop business strategies around the models they are creating – this may be to form institutional spin-outs or to work on student created new businesses that have access to institutional data sources
2. Intellectual property release – Some of the partners – particularly those with obligations to government have large amounts of models and data that could be useful to industry and broader society, but who are not sure of the copyright/ use of these models. Partners will be encouraged to discuss with government ways of licensing data for commercial use – therefore the development of workshops and some legal advice around this would be beneficial to innovating data into society



Figure 6: Oasis+ funding structure and information flow

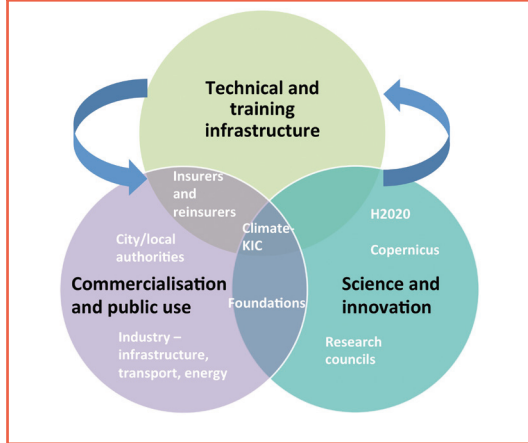
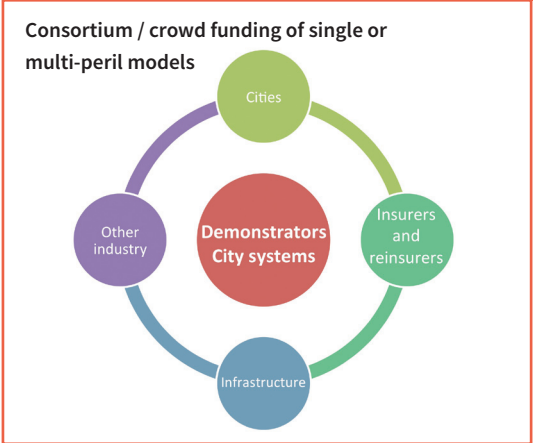


Figure 7: Oasis+ funding structure for demonstrators



Funding and investment strategy

The Oasis Consortium currently consists of Imperial College London, UK; ARIA Technologies and the Commissariat à l'énergie atomique et aux énergies alternatives (CEA), France; Deltares and Delft University of Technology, Netherlands; and Potsdam Institute for Climate Impact Research (PIK) and GFZ German Research Centre for Geosciences, Global Climate Forum, Germany and the Technical University of Denmark (DTU), Oasis PalmTree Ltd and Oasis LMF Ltd. The consortium intends to act as a group in applying for co-funding and complimentary funding sources. The funds requested from Climate-KIC will act as leverage funds for other forms of funding. The Consortium believes that a mixed economy of funders and investors will stabilise the programme to ensure market expansion is possible and will be involved in identifying and securing partners (see **Figure 6**).

The demonstrators will also act as focus point for 'higher level crowd' / consortium funding consisting of members from the demand side with the intention to reduce costs dramatically for individual stakeholder organisations. For example, see **Figure 7**.

Conclusion

A detailed strategy and business plan is available for scrutiny and this paper is only intended to offer a broad overview of the Oasis+ strategy, commercialisation and funding approach. To this extent the document above is a simple summary of Oasis+.

We believe we have first mover advantage in the sector and have already developed a good reputation evidenced by receiving two industry innovation awards in 2014 and attracting 44 Insurers and Reinsurers as members of Oasis Loss Modelling Framework. The Oasis Consortium now see themselves as being a strong and effective consortium able to deliver tangible, concrete results, attract funding and investment, as well as rapidly innovate appropriate methodologies and products required by different sectors.