Appendix 3.2

Financial mechanisms for protection of investor's interest

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Contributors:

Thomas Dunand (Hannover Re)

Sabine Bernard (Hannover Re)

Alexandre Bied-Charreton (Allianz)

Jean-Jacques Doreau (Allianz)

Claire Doutreluingne (APAVE)

Marion Decalf (APAVE)

Kim Haugbølle (SBi)

Stefan Christoffer Gottlieb (SBi)

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1.1 Financial mechanisms for protection of investor's interest

Apart from insurance as described in the mapping, other financial mechanisms essentially regard energy performance.

1.1.1 Energy performance guarantees

True Energy Performance Insurance can be found through Energy Savings Insurance (ESI). Nonetheless this type of protection is apparently no yet developed in Europe. May 2010 EC report (European Commission - Directorate General JRC 2010), specifies that:

> *"ESI is a formal insurance contract between an insurer and either the building owner or third-party provider of energy services. In exchange for a premium, the insurer agrees to pay any shortfall in energy savings below a pre-agreed baseline, less a deductible. Pricing is typically expressed as a percentage of energy savings over the life of the contract, although it is sometimes expressed as a percentage of project cost. The premium is paid once, in the first year of operation.*
> *Such policies are non-cancellable, so the owner is guaranteed to have access to the insurance for the originally agreed contract term.*
> *Energy saving insurances typically insures annual savings expectations (a "volumetric" approach). Energy-savings insurance can reduce the net cost of energy-saving projects by reducing the interest rates charged by lenders, and by increasing the level of savings through quality control. […]*
> *ESI is widely practiced in Canada and in the US; in Europe the global market of risk transfer is slowly growing up, but insurance products such as ESI are still limited. In the US several insurance companies already offer ESI, which traditionally has been used to guarantee power reductions at retrofitted buildings. State governments have led ESI efforts, with several requiring such insurance from firms that provide energy management services in state-owned facilities."*

If Energy Savings Insurance (ESI) is an insurance protection, other forms of contractual financial protection exist, commonly referred to as Energy Performance Contracts (EPC):

> *"An EPC is a performance-based procurement method and financial mechanism for building renewal whereby utility bill savings that result from the installation of new building systems (reducing energy use) pay for the cost of the building renewal project. A "Guaranteed Energy Savings" Performance Contract includes language that obligates the contractor, a qualified Energy Services Company (ESCo), to pay the difference if at any time the savings fall short of the guarantee."* (EUESCO 2011).

Indeed EPCs looks very attractive since for the customer the cost of the improvements' investment is paid back from the savings, while the risk of the savings falling short is bared by the ESCo (Sustainable Energy Authority of Ireland 2013).

It is clear that the EPC market is essentially aimed to the industrial and corporate buildings, where:

- The construction process is often a Build-Operate-Transfer (BOT) project type, where design, construction methods and building operation (including maintenance) are totally integrated and assessed as a whole (from the very beginning of the project).
- The energy use of the building is organized, with a defined range of "normal activity". Single users' behaviour have nearly no impact on the effective energy consumption, hence performance, of the building.

Therefore this type of protection doesn't totally satisfy one of the underlying goals of the Elios2 project which is to promote eco-technologies' activity, including when intended for housing.

Even though, as stated out here before, apart from self-financial protection, i.e. auto-insurance, at this stage of the study, Energy Performance Guarantees appear to be the only existing non-insurance general protection in Europe.

On the other hand, the need for an equivalent insurance protection grows rapidly in conjunction with the development of Energy Performance Contracts throughout Europe (ENHR 2011), at the moment, pure insurance offer seems to fail in its attempt to cover completely these new requirements.

We will see in following paragraphs the reasons underlying this situation and where non insurance solutions exist.

After discussion with different actors of the market, Energy Performance Guarantees appear to be currently almost inexistent in the European insurance market.

The only real existing European performance guarantees concern specific equipment: essentially photovoltaic panels. The following cases could be identified:

- Solar Insurance & Finance - Solarif (Solarif 2015);
- Munich Re offer, but it concerns a few selected very large industrial PV panels manufacturers.

Even though these insurance offers may appear as a success, it remains focused on a specific system and can hardly be extended to a whole construction. The problem of insuring performance of a building is far more complex and represents a huge challenge as we will see in the following paragraphs.

On the other hand, some brokers tried to implement some specific guaranties on the installation of efficient boilers within private renovation works, but it apparently did not find commercial success, mainly because of a lack of the demand from the consumer.

Otherwise, we can see the development of some guarantees on the equipment malfunctioning (e.g. on PV panels), or machinery breakdown (MB), with possible business interruption (BI) extensions, but not on real performance guarantees.

1.1.2 Guarantee of Conventional vs. Real performance

Conventional performance is the theoretical performance of a construction work, based on the technical characteristics of the construction, under standard conditions of use (set of usage rules and maintenance requirements made by the designer).

It has to be opposed to the real effective performance of the building, expressed by the real energy consumption or production of the building. This performance is achieved according to the behaviour of the user, which depends on its own definition of what is normal, for instance in terms of perceived comfortable temperature or aeration of the rooms.

While the design and construction of the building is based on a conventional performance, the achieved performance is partly based on outstanding variables, behaviour of the user and effective climate conditions for example.

The Conventional Performance requirements are met if certain materials are used and follow a set of implementation rules. Therefore the effective real performance is not a requirement and can hardly be a factual objective in construction works where performance depends on the user's behaviour.

1.1.3 Measuring the energy performance

The 2010/31/EU (European Parliament and of the Council 2010) directive which aims to increase building energy performance requires from the state members to develop a calculation method in order to assess energy performance regarding the "energy performance of a building" (European Renewable Energy Council 2015).

By definition these theoretical tools rely on a very simplified appraisal of the real energy performance of a building not taking into account some important components of energy consumption (such as appliances). Therefore they give results that can be quite far from real life results, even though they are absolutely consistent with material and mechanical laws.

The existence of various tools increases even more the gap between theoretical design rules used to build and the effective consumption.

The question therefore becomes: what type of energy performance can be insured? Is it possible to insure the gap between expected performance and observed performance?

If achieved, real performance can be simply measured by real energy consumption; it is not a desirable insurance product, since it does not cover inherent performance of the construction work.
On its side, conventional performance still needs a standard framework that could assess material, design and workmanship of the construction work.

Considering the link between the energy performance and the equipment of the construction (notably HVAC) or the maintenance of the envelope/equipment of the building, the duration of the warranty has to be adjusted consistently with the lifespan of these elements.

1.1.4 Existing financial energy performance guarantees

Outside insurance protection, the only Energy Performance guarantees that could be found is aimed at office buildings, where:

- The final use of the building can be defined and foreseen independently from personal behaviour.
- The performance management systems are implemented from the very beginning of the project design, integrating all building actors as a whole. The different compounds of the final performance of the construction work, i.e. materials (products), design and workmanship must be assessed by the different responsible actors on common grounds. It has to be an integrated approach with operative problematic in mind.

In order to bypass the lack of guarantees from the private sector, some governments decided to encourage energy performance improvements through public financing, thus doing ESI and taking the risk of failure of the investment:

Germany:	KFW Bankengruppe (KFW 2015)
United Kingdom:	The UK Green Investment Bank plc (Greeninvestmentbank 2015)
Belgium:	Fedesco (Fedesco 2015) (for public buildings)

At a municipal level, Berlin City also carried out an Initiative through its Environmental Improvement Programme (EIP) (European Foundation for the Improvement of Living and Employment and Working Conditions 2000).

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