

Task 59

Renovating Historic Buildings Towards Zero Energy



In November, the IEA SHC Programme finalized its work on *Renovating Historic Buildings Towards Zero Energy* (SHC Task 59/EBC Annex 76). To learn first-hand about the Task's impact on historic buildings, we asked Alexandra Troi, the Task Operating Agent, to share some of her thoughts on this multi-year project.

Why is a project like this needed?

Alexandra Troi (Alexandra): Buildings matter in that they take up about a 40% share of the total energy consumption in Europe. So, we're talking about the single largest sector of energy use. If 25% of buildings were constructed before 1948 (in the UK, Spain, and France this percentage is even higher), we absolutely have to consider them when it comes to the energy retrofit of historic buildings. There are a lot of interesting solutions for strengthening the solar position in the future renewable energy mix. And, this is one area.

What is the current status of the technology?

Alexandra: There are many solutions to retrofit historical buildings, and projects are most successful if in a comprehensive manner include bringing down the demand with all kinds of solar – from solar thermal, photovoltaics, and passive solar to daylight. People just often don't know. That's why we started collecting best practice examples in our HiBERAtlas (www.hiberatlas.com) to show how historic buildings can be renovated to achieve high levels of energy efficiency while respecting and protecting their heritage significance.

Is there one outcome that surprised you?

Alexandra: I was totally surprised about the variety of solar solutions that we came across. From building-integrated

photovoltaics, such as solar shingles designed to look like and function as conventional roofing materials while also producing electricity to non-reflective solar modules for places where you need to visually hide them, we had them all. Overall, we found 37 different solar solutions for retrofitting historical buildings all over Europe.

Do you have a Task success story from an end-user or industry to share?

Alexandra: More than one since we worked on 69 case studies ranging from very old buildings (including a church) to younger ones, from city dwellings to farmhouses. But when Julia Ludwar, from the one Bavarian federal state office for the preservation of historical monuments, told me that she uses the HiBERAtlas to advise building owners, I knew that all of our hard work was totally worth it.

How has the Task's work supported capacity and skill building?

Alexandra: We did not only collect best practices, but we also elaborated a HiBERTool. Following a simple question and answer series, the building owner or technician can immediately find out which retrofit solution is the best for his historic building. The HiBERAtlas and HiBERTool are not only centered on solar but include windows, walls, ventilation, and heating too.

We also developed a course for the Chamber of Architects of South Tyrol based on the best practice content of the HiBERAtlas, and I offered an elective subject for the University of Coburg – to mention one specific example. Many university students have contributed to the success of this project by documenting farmhouses in South Tyrol and buildings in Germany. They learned a lot by interviewing architects, technicians, and building owners. Unfortunately, a lot had to be done online because travel was quite restricted over the past two years. But actually, all the Task experts were active in using the Task's results for increasing skills in their area!

What is the future of the technology – new developments, markets, policies, etc.?

Alexandra: I am confident that the demand for the energy retrofit of historic buildings will increase, also thanks to initiatives such as the New European Bauhaus. I believe that the timing for publishing our project results couldn't be better. The results can be used as guidelines on how to apply the European Standard in retrofitting historic buildings. For now, the European Standard is a bit abstract and not often used in practice – hopefully, that'll change soon too.

continued on page 23

Task 59 Interview *from page 22*

What were the benefits of running this as an IEA SHC Task?

Alexandra: For over three years, 64 experts – architects and engineers to historical preservationists – from 13 countries put their expertise together. That alone is impressive and guarantees well-balanced project outcomes.

Will we see more work in this area in the IEA SHC Programme?

Alexandra: Topics abound. If we get the funding for a follow-up project, many of us will be in.

You can learn more about this Task's work and find all the reports, online tools, videos, touring exhibition details, and blog by visiting the [Task's webpage](#) and you can watch a [webinar](#) highlighting the Task's major outcomes.

Historic Building Energy Retrofit Tool

The web-based [HiBERtool](#) helps practitioners find the perfect solution for conserving historic buildings. The tool explains more than 150 retrofit measures, ranging from increasing a building's energy efficiency to providing solar energy on-site. With just a few clicks, users can get solutions tailored specifically to their needs. Page navigation is fairly intuitive, so reading a manual is unnecessary. All solutions come with a detailed description in a downloadable PDF.

How it works, the HiBERtool uses three major criteria to help you find solutions for your specific building needs: historic conservation value, living comfort and energy efficiency, and solar energy use.

The current version includes:

- 60 solutions for windows (box type, single and coupled windows)
- 40 solutions for walls (solid walls and (half) timber framing)
- 18 solutions for building ventilation
- 40 solar thermal and PV solutions (mainly building-integrated elements)

A complement to the HiBERtool is the [HiBERatlas](#), an online database detailing 57 of Europe's retrofitted historic or listed buildings.

The tool's development was supported by two projects, IEA SHC Task 59: Renovating Historic Buildings Towards Zero Energy and Interreg Alpine Space ATLAS.