

# Learning from new, very low-energy buildings

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A holistic approach is necessary to successfully plan and construct energy efficient buildings. But implementing best practices elsewhere is not a straightforward task.

To tackle [climate change](#), new buildings are required to consume as little energy as possible. That's because, in Europe, buildings are responsible for about 40% of our [energy consumption](#). The EU energy performance of buildings Directive therefore imposes a near zero-energy consumption

for all new buildings by the end of 2020. New public buildings have to be built according to this standard by the end of 2018. In this context, the EU-funded project DIRECTION, due to be completed in 2016, aims to implement suitable technologies to demonstrate the feasibility of creating very low energy buildings.

The project features three case studies in Germany, Spain and Italy, which may serve as best practice examples to be adopted by other sustainable buildings. "If you have successfully planned and constructed a [building](#), which has very low energy demand [while retaining the] highest room comfort, then it is a 'best practice' building," says Jan Kaiser, research associate at the Fraunhofer Institute for Building Physics IBP in Kassel, Germany. Best practice also means that the know-how is applicable for any location, Kaiser adds. This is, for example, the case for the new office building NuOffice in Munich, Germany, which recently received the international Platinum LEED certificate for [green buildings](#).

However, implementing best practices in other locations is not a straightforward task. "There is not a single method," points out Norberto Gonzalez, project partner and business developer at 1A Ingenieros in Valladolid, Spain. "You cannot use the same technologies in different countries," he tells Directions. This is due to the different climatic conditions and the availability of different natural resources for supplying renewable energy. The market development and the local technological know-how also matter. Moreover, national regulations may set the limits for the way in which energy efficient technologies are applied.

Another important issue is to carefully think about the building's design from the very beginning, according to Gonzalez. This ranges from considering key issues, such as orientation and insulation, to specific ones, such as air conditioning systems and lighting. This is because "the

first design decisions will have a very high impact on energy efficiency," Gonzalez stresses. But this design phase may also prove difficult. "You can do calculations. But there are always more variables than those you can think of. The only way to deal with that problem is to look at the real world [implementation]," he tells Directions.

Moreover, it is crucial to integrate the new building into the local district, which also matters in terms of utilising local energy resources, according to Gonzalez. "And there has to be an intelligent [energy](#) management system to ensure proper operation," he adds. In Gonzalez's experience, it is also very important that the building matches the owners' requirements. "Communication is the key point in best practices," he tells Directions.

Indeed, "architects, engineers, project developer, building physicists—all the actors involved—have to agree on the desired performance of the building and how to reach the goal," Kaiser concurs. "The building has to be optimised in a holistic way," adds Kaiser. In his view, it is therefore crucial to bring together all actors at a very early stage of the planning. This so-called integral planning includes concepts that help establishing useful communication networks. Most importantly, the project developer has to have a deep understanding for a building's performance, according to Kaiser.

Another expert agrees. "You have to communicate first and then identify the targets," says Rory Bergin, architect and sustainability expert at a company called HTA Design based in London and Edinburgh, UK. In his view, this is particularly true when introducing new technologies and materials, which is often the case in sustainable buildings. "Designers need to be good at designing but also at persuading", he adds. This is because the different experts involved in the planning and construction of the building, including insurance companies, are often sceptical about new materials and technologies.

However, Bergin also points out that it is not always possible to involve all stakeholders from the very beginning. "Often, offices are not built for specific customers," he says. Rather, they are built and then rented out. "You therefore have to make the system simple," he adds, to keep flexibility and make the building attractive for various users. He also sees a need to develop metrics that characterise and present the quality of a [sustainable building](#). "As time goes by, there will be more awareness of sustainable buildings and thus more expectations," he says. "But to allow people to make informed choices there need to be metrics they are familiar with," he concludes.

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