When Markus Schroeder started renovating his family's home in northern Germany to make it more energy-efficient, he got help from an unexpected source: Germany's state-owned bank, KfW Group. KfW gave Mr. Schroeder a 10-year mortgage at 2%, well below the market rate of 3.6% at the time, and knocked 8,500 euros (about $12,500) off what he owed to help pay for labor and materials.

Such incentives are part of an ambitious campaign launched by Germany in 2001 to reduce energy consumption in the housing sector and fight global warming. Dubbed the CO2 Building Rehabilitation Program, it helped fund renovations of 180,000 homes in 2006, the latest year for which data are available, which was three times more than in 2005. These refurbished houses will emit about a million tons less of carbon dioxide annually than if they hadn't been renovated, according to the German government. But the program's success hasn't come cheap: The German government spent 1.5 billion euros on it last year, and has pledged another billion euros annually for the next three years.

Across Europe, countries are experimenting with policies to encourage homeowners, renters and landlords to make buildings more energy-efficient. They've been prodded by the European Union, which as part of its effort to fight climate change has set an ambitious goal to cut energy consumption in buildings 11% by 2020. Some 40% of the world's energy consumption and a quarter of greenhouse-gas emissions stem from heating, cooling, and lighting everything from homes and offices to hospitals and train stations. That's roughly akin to what is used on transport, including cars and planes.

The EU has been a leader in tackling the reduction of greenhouse gases, and its efforts in the building sector could provide valuable lessons to other countries trying to ratchet down energy use. In the U.S., some companies such as Citigroup Inc. and a handful of states such as California have launched efforts to improve energy efficiency in buildings. But in general, the U.S. has been slower to devise policies to address the problem. The EU, meanwhile, has mandated that member states renew their building codes every five years and create standards to calculate the energy efficiency of buildings. Another measure calls for all buildings to submit a report card, or "energy certificate," which can be shown to prospective buyers or renters. The hope is that grading buildings on their energy efficiency will spur landlords and owners to undertake renovations.

Already, these measures are boosting the fortunes of companies that make energy-efficient products. For example, Rockwool International AS, a Denmark-based insulation firm, has seen its sales grow 22% in 2007 to reach about $2.78 billion, on top of 15% growth in 2006. Rockwool is currently building five new factories.

Some countries, including Germany, Britain and Denmark, have already implemented most of the EU measures, but others, including Poland, the Czech Republic, Greece and Italy, are lagging behind. Nearly all countries have updated their codes to incorporate tough energy standards for new buildings. But in Europe, where many residences are centuries old, only 1% of the housing stock is renewed each year. Figuring out how to get property owners to renovate existing buildings is a trickier and costlier problem.

"If governments are going to really tackle the problem effectively, they've got to get people to improve
the existing building stock,” says Jens Laustsen, who specializes in energy efficiency at the
International Energy Agency, a Paris-based organization that studies energy policies and prices in its
27 member states. “The problem is how do you effect change without annoying voters too much?”

Saving energy in buildings isn’t rocket science. Products such as thicker insulation, double-glazed
windows, heat pumps, and low-energy lighting are all commercially available. But the obstacles to
change are considerable. Chief among them are the lack of awareness among building owners and
renters, and the fact that people don’t often want to spend money up front even if it means lower
energy bills in the future. Landlords of office buildings or homes have no incentive to improve energy
efficiency because the tenants foot the electric or heating bills.

To overcome these barriers, countries in Europe are experimenting with different kinds of incentives
such as tax breaks, subsidies and regulations.

The U.K. came up with a different approach from Germany’s, relying more on the private sector and
using far less government money. In 2002, the government required the major gas and electricity
suppliers to meet a certain energy-savings target by 2011. Companies such as British Gas PLC,
Electricite de France SA, and Scottish & Southern Energy PLC were assigned an amount of energy
they had to save depending on their share of the British market. The companies then had to persuade
their customers to adopt energy-saving measures. The utilities are allowed to tack on a surcharge to
every bill, and then use the proceeds to help customers carry out their conservation measures.

Jeremy Parsons, the energy-efficiency manager at British Gas, says that since 2002, the firm has
handed out 37.5 million low-energy light bulbs, replaced 5.4 million appliances with higher-efficiency
models, and insulated 1.5 million homes. These moves saved 73.5 gigawatts per hour of electricity
and about 52 metric tons of carbon-dioxide emissions, according to the company. “The key is
engaging consumers in energy efficiency,” says Mr. Parsons.

But the U.K. system has its flaws. Instead of helping residents renovate whole houses to improve
efficiency, the utilities tend to spur people to do one measure at a time. The utilities also steer
consumers toward the least-expensive measures, such as replacing insulation. They often eschew
the more costly solutions, such as new windows.

“It's not worth the utility company's while to do the whole house,” says Andrew Warren, director of the
European Alliance of Companies for Energy Efficiency in Buildings, a Brussels-based trade
association of building companies. Moreover, a “great number of buildings are not dealt with at all,” he
adds, such as older homes with solid walls because they cost more to insulate than homes with
hollow walls.

Mr. Warren prefers the German approach. The loans and tax breaks, which are offered on homes
built before 1983, give an incentive to homeowners to tackle energy-efficiency problems at the root
rather than cherry-pick quick-fix solutions. “In the long-term, it's much more sensible,” he says.

Through KfW, the German government started its program by issuing low-interest loans to people
who redesigned their homes to meet energy-efficiency standards in the building code.

Then in 2006, the program started awarding grants to homeowners who surpassed the standards, like
Mr. Schroeder, whose home in Oberhausen wound up exceeding the building-code standard by more
than 50%. Mr. Schroeder, an energy-efficiency consultant for a German firm called Build Desk,
replaced the windows in his four-bedroom house, which was built in 1952. He put new insulation in
the roof, attic and walls, and purchased a heating system that burns wooden pellets instead of oil or
gas. In total, Mr. Schroeder spent 11 months and some 140,000 euros on the renovations.

“It was a lot of work,” he says. “But I wanted to do this completely, and not some halfway solution.”

Mr. Schroeder says the KfW program worked smoothly for him. “People are always worried about the
upfront costs, and this is a good way to bring those down,” he says.

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