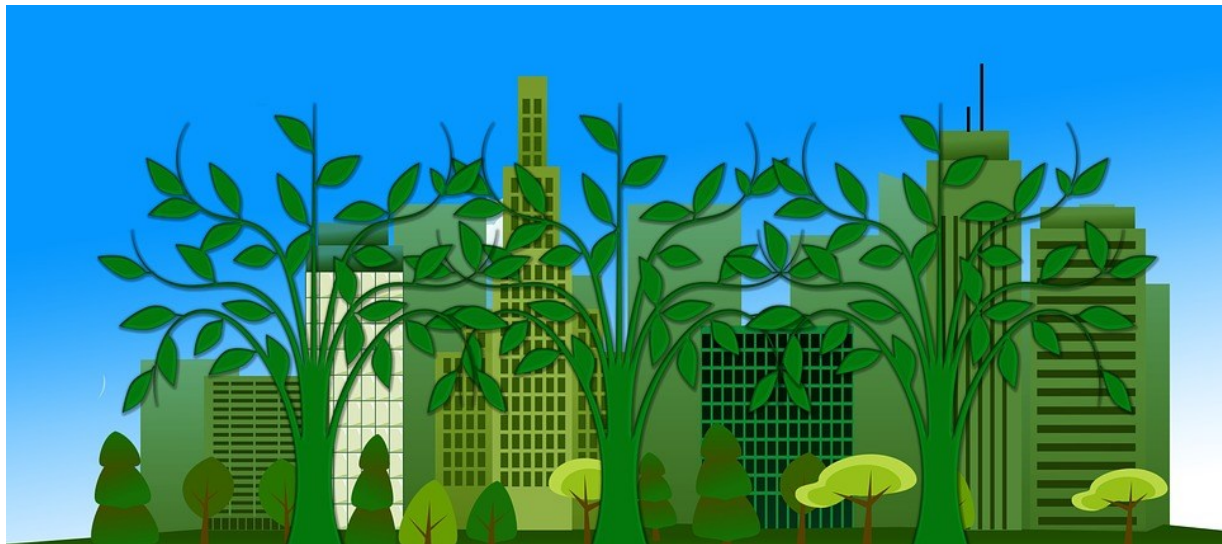




**Economic Information Observatory**  
a regional cooperation project between  
**Atlantic Canada** and **Saint-Pierre and Miquelon, France**

## Eco-Friendly Housing



Atlantic Canada (p. 1-4)

Saint-Pierre and Miquelon, France (p. 5-8)



## Eco-Friendly Housing in Atlantic Canada

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Why are people increasingly seeking **eco-friendly housing** options, and what features does a home require in order to qualify as eco-friendly or environmentally responsible? Personal comfort is clearly very important, as is the potential for long-term financial savings, but along with these objectives comes the desire to take part in a collective movement to protect the environment. In the wake of the Paris Agreement of 2015, Canada has committed to reducing greenhouse gas emissions, and in aiming for this goal, it has embraced initiatives including updating environmental standards in the construction industry among other sectors. By 2050, the **Zero Carbon Building (ZCB) Standard**, launched in 2017 and championed by the **Canada Green Building Council (CaGBC)**, targets achieving zero carbon emissions from commercial, institutional and high-rise residential buildings in accordance with the CaGBC's **certification standard**. In light of the fact that the current energy consumption of buildings accounts on average for 17% of all greenhouse gas emissions produced in Canada, it is anticipated that reducing energy consumption will go a long way toward protecting the environment by preserving natural resources. For additional information on this topic, please see also **Focus**, vol. 5, no. 7, 2018, and **Intell-Echo**, vol. 3, no. 3, 2016.

### Canada's Buildings Strategy

At the Energy and Mines Ministers' Conference held in St. Andrews, NB, in August 2017, Canada established the guidelines for a national buildings strategy. The adoption of this strategy is based on an innovative approach to building smart. Eco-friendly building means creating options for living in a comfortable built environment while also reducing energy consumption and environmental impact. The eco-friendly or eco-responsible housing sector is constantly evolving in this regard: the Canadian standards defined more than 25 years ago helped to lay the foundation for an industry that has since successfully kept pace with both technological and societal changes that have guided the development of new codes and standards to govern the industry. The federal, provincial and territorial governments have also committed to work together to ensure that the provinces and territories are ready by 2030 to adopt a "Net Zero energy-ready" building code. Subsequent to updating Canada's Buildings Strategy in 2018, the country committed to supporting the construction of more energy-efficient buildings and renovating existing buildings to the standards in place. Canada will also be supporting the adoption of new building codes and the construction of more energy-efficient buildings in Aboriginal communities. In accordance with this nationwide strategy, the development of model building codes is intended to lead to the adoption of Net Zero energy-ready building codes by all provinces and territories by 2030. Provincial governments have also undertaken to produce a model code for existing buildings by 2022; once this code is in place in all provinces and territories, energy-efficient improvements will be targeted as part of building renovations.

In 2014, Canada's sustainable building industry injected \$23.45 billion into the country's GDP and created 297,890 direct jobs

- 69% of Canadians own a home
- 4 of 5 millennials plan to buy a home
- Based on a nationwide study carried out in 2017 on consumer preferences with regard to buying a home, the most commonly sought features were environment-related (energy-efficient appliances, high-efficiency windows, overall energy-efficient home, HRV/ERV air exchanger)
- The construction and renovation industry generates \$120 billion in annual revenue and provides jobs to more than 845,000 workers

Most widely used green building rating systems in North America

### Green Globes

- Online sustainable management tool featuring an assessment protocol, a rating system and guidance for green building design, operation and management

### Leadership in Energy and Environmental Design (LEED)

- Green building rating system providing a framework for the design, construction, operation and maintenance of highly efficient and cost-saving green buildings

### ICC 700 NAHB National Green Building Standard

- Standard developed by the National Association of Home Builders in the U.S. for home builders and remodelers; outlines a variety of green practices in residential design, development and construction

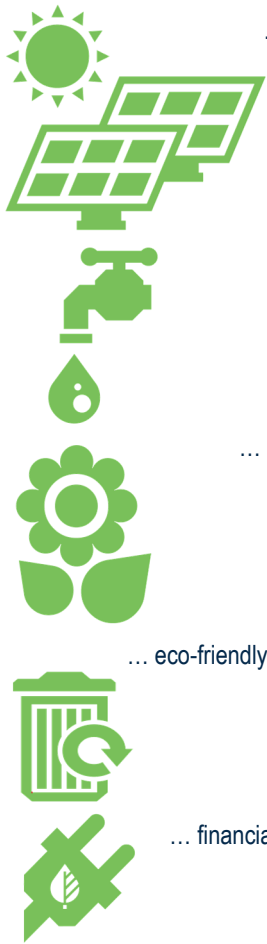
### Additional information:

Sustainable Forest Management Canada, <<https://www.sfmcanada.org/>>; Canadian Home Builders' Association NB, <<http://www.nhomebuilders.ca/>>; Canadian Home Builders' Association, <<http://www.chba.ca/>>; Canada Green Building Council, <<https://www.cagbc.org/>>; Eco-Habitation, <<https://www.ecohabitation.com/>>; Passive House Canada, <<http://www.passivehousecanada.com/>>; Quebec's sustainable construction portal, <<http://www.voirvert.ca/>>; Natural Resources Canada, <<http://www.mcan.gc.ca/>>; Statistics Canada, <<https://www.statcan.gc.ca/>>

# Environmental Impact of Eco-Friendly Housing

In January 2018, with a view to promoting energy efficiency in Canada and mitigating the negative impact of climate change, the federal government announced plans to allocate \$182 million toward improving the design, renovation and construction of new and existing buildings. **Research, development and demonstration (RD&D)** projects will also be supported through the **Green Infrastructure Fund**, which will promote the development of building codes for existing buildings and new, Net Zero buildings.

## A new, more eco-friendly home means this when it comes to...



	Examples of energy upgrades and their benefits
... energy	Use better insulation, high-efficiency windows, advanced heating and ventilation systems, affordable heat pumps, on-demand water heaters, combined space heating and domestic water heating systems.  EnergyStar® household appliances and halogen, compact fluorescent or LED lamps also help to save energy.
... water	Install low-flow toilets and faucets, collect rainwater and recycle gray water.  Using this natural resource more wisely helps to reduce the cost of water consumption.
... indoor air	Install a heat-recovery ventilator (HRV).  Aim also to use non-toxic materials and products during construction to help minimize air contamination.
... eco-friendly products	Make smart choices: purchase products made from sustainably managed renewable or recycled materials.
... financial savings	Take advantage of environmental incentive programs offered by provincial governments or utility companies. Savings on purchase cost: energy-efficient mortgage, lower interest rates, lower mortgage insurance premium.

### Overall environmental impact of buildings

Impact of typical housing units on the quality of natural resources: water, trees, biodiversity, daylight, air, soil.

This impact can account for:

- ▶ 25 to 40% of total energy use
- ▶ 30 to 40% of greenhouse gas emissions
- ▶ 30 to 40% of waste generated
- ▶ 20% of total water consumption

Sustainable buildings offer advantages including the reduction or elimination of...

- ▶ ... more than 28% of energy use
- ▶ ... 10 to 50% of potable water needs
- ▶ ... more than 90% of construction waste
- ▶ ... more than 50% of wastewater
- ▶ ... more than 75% of wastewater production

Gains:

- ▶ 12.8 billion litres of water saved
- ▶ 1.26 million tonne reduction in CO<sub>2</sub> emissions
- ▶ 1.6 million tonnes of construction waste recycled

Source: Canada Green Building Council

### Economic impact of residential construction (new homes, renovations and repairs) in 2017

	On-site and off-site construction jobs	Wages and salaries	Total investment
Canada	1,230,381	\$73.6 billion	\$150.9 billion
PEI	4,247	\$211 million	\$450 million
NB	17,150	\$907 million	\$2.0 billion
NS	33,484	\$1.8 billion	\$3.2 billion
NL	11,982	\$766 million	\$1.5 billion

### Economic impact of the green building industry in Canada

Jobs in construction and trades in the green building sector account for approximately 13% of all construction jobs in Canada.

#### % of jobs in green building Sector

Construction and specialized trades*	55%
Materials and manufacturing	26%
Professional services	10%
Policy and education	7%
Waste management and recycling	2%

# Standards Applicable to Eco-Friendly Housing

## EnerGuide Rating System

Natural Resources Canada is in the process of overhauling its EnerGuide Rating System for homes. Throughout the Atlantic Provinces and nearly everywhere else across Canada, rather than rating homes for energy efficiency on a scale from 0 to 100, the new EnerGuide Rating System measures energy efficiency in gigajoules (energy consumption based on source, energy performance compared to that of a model home, breakdown of energy consumption, quantity of GHG emissions, etc.). Under the new system, optimal performance would be given a rating of 0. To date, home assessments using the EnerGuide system have led to more than 900,000 renovation projects with the goal of enhancing energy efficiency.

## ENERGY STAR® certified homes

ENERGY STAR certified homes combine comfort and savings, notably by incorporating efficient air heating and cooling systems and high-performing doors and windows. There are already 60,000 ENERGY STAR certified homes across Canada. This program is voluntary. To earn the ENERGY STAR label issued by the Canadian government, an ENERGY STAR home must have been constructed by an ENERGY STAR recognized builder. It is to be noted that the ENERGY STAR standard is an add-on to building code standards and requirements and is specifically designed to be about 20% more energy-efficient than a typical home. For 90% of Canadians, the ENERGY STAR standard is their most valuable tool when it comes to making informed decisions on issues relating to energy performance.

- Since the launch of ENERGY STAR for new homes and the R-2000 initiative, 95,000 new energy-efficient housing units have been built in Canada
- To date, a total of 1,170,000 homes have been assessed for performance under the EnerGuide Rating System
- Some 937,000 energy efficiency retrofits have been done in response to EnerGuide home assessments
- 83% of Canadians are aware of the ENERGY STAR program

## Net Zero homes

A Net Zero home is a building that produces at least as much energy as it consumes on an annual basis through use of locally based renewable energy systems. In NB, if a certified Net Zero home produces more energy than it consumes, the homeowners are credited for the surplus by NB Power, that province's power utility.

## R-2000 certified homes

The R-2000 rating was developed in close collaboration with building industry professionals and other stakeholders in the housing construction sector. Officially established in 1982, the program has been used to set reference criteria for building homes recognized for their high energy efficiency, high levels of insulation, clean-air features and other characteristics that protect the environment. Natural Resources Canada rolled out an updated standard in 2012. Constructed by certified, specially trained builders to the strict requirements of the governing standard, R-2000 homes are on average 50% more energy-efficient than typical new homes built to code. R-2000 is a voluntary standard administered by Natural Resources Canada.

## LEED (Leadership in Energy and Environmental Design)

Leadership in Energy and Environmental Design (LEED) is a North American standard for building construction or major renovation established by the US Green Building Council in 1998 and comparable to the Haute qualité environnementale standard in France. The LEED system targets the high environmental quality and sustainable design, construction and operation of commercial and institutional buildings. There are four possible levels of certification: Certified, Silver, Gold and Platinum. Canada boasts nearly 3,000 LEED-certified projects, making it a leader in the sustainable building market (buildings and spaces).

## First LEED Platinum certification in Atlantic Canada in 2010

In 2010, a home in Nova Scotia became the first in Atlantic Canada to earn LEED Platinum certification.

## Net Zero energy-ready homes

A Net Zero energy-ready home has infrastructure in place to access an on-site renewable energy system with the goal of being Net Zero in the future.

The first Net Zero home in Newfoundland and Labrador was built in Flatrock in 2016. Awarded the Mark of Excellence, the home was constructed and labelled under the Net Zero Home Labelling Pilot Program of the Canadian Home Builders' Association.

Energy efficiency compared to building code	Standard/certification
+20%	ENERGY STAR
+50%	R-2000
Up to 80%	Net Zero energy-ready home
100%	Net Zero home

Average annual household energy consumption by building type	
Typical single-family home	29,700 kWh/year
Apartment	9,200 kWh/year
Townhouse/duplex	26,000 kWh/year
Net Zero home	10,000 – 11,000 kWh/year

Availability of non-financial programs offered in the Atlantic Provinces (June 2018)				
Program				
Awareness/information (targeting general public)				
PEI	NB	NS	NL	
◇	◇	◇	◇	
Training/technical information (targeting professional certification)				
PEI	NB	NS	NL	
◇	◇			

Availability of incentive programs in the Atlantic Provinces (2018)				
PEI	NB	NS	NL	
Windows				
ENERGY STAR windows				
△	△	△		
Air heating				
Natural gas heat pumps				
	△			
Cold climate air-source heat pumps				
△	△	△	△	
Geothermal heat pumps				
△	△	△	△	
Water heating				
Natural gas heat pumps				
	△			
Electric heat pump water heaters				
△	△	△		
Condensing storage tank water heaters				
△	△			

## LEED Certification

On the annual *Top Ten Countries and Regions for LEED* list of the U.S. Green Building Council (USGBC), Canada ranks second worldwide, excluding the United States, for use of the LEED system. Although the United States is not included on this list, it remains the largest LEED market globally, with 30,669 projects and 385.65 million square metres LEED-certified.

Country	Number of projects earning LEED certification as of Dec. 31, 2017	Total area
China	1,211	47.16 million square metres
Canada	2,970	40.77 million square metres
India	752	20.28 million square metres
Brazil	461	14.83 million square metres
Germany	276	7.00 million square metres
South Korea	106	6.66 million square metres
Taiwan	124	6.15 million square metres
Turkey	245	6.06 million square metres
Mexico	305	5.16 million square metres
United Arab Emirates	207	4.41 million square metres

Based on data from the U.S. Green Building Council (USGBC)

Global economic impact of LEED-certified projects in Canada over the 10-year period between 2005 and 2015:

- ▶ \$62.3 billion contributed to GDP
- ▶ 701,700 jobs created
- ▶ \$128.0 billion in gross revenue generated

The **Canada Green Building Council (CaGBC)** is the voice of sustainable building and responsible for implementation of the LEED® sustainable building assessment system in Canada.

Since 2002, the CaGBC has delivered training to more than 30,000 professionals. It is also active in the areas of project certification, education and research.

In 2017, the CaGBC established the first Zero Carbon building (ZCB) standard in Canada.

### Outcomes to date since 2005 in Canada due to LEED certification

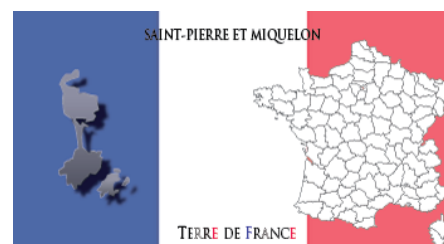
<b>Energy savings:</b>	6,503,647 eMWh (this is enough energy to supply power to 220,702 homes in Canada for one year)
<b>Water savings:</b>	12.8 billion litres (enough water to fill 5,131 Olympic-sized swimming pools)
<b>Recycling:</b>	1.6 million tonnes of construction and demolition waste (enough to fill 491,174 garbage trucks)
<b>GHG reduction:</b>	1,261,016 tonnes of CO <sub>2</sub> equivalents (the same as removing 238,377 vehicles from the road for one year)
<b>Green roofs:</b>	231,608 square metres of green roofs installed to reduce the impact of heat islands in cities as well as reduce rainwater runoff in designated areas (this surface area corresponds to 153 NHL ice rinks).

- ◇ In Canada, total LEED floor area has increased tenfold within the last five years (2009-2014) from 1,931,403 m<sup>2</sup> to 23,742,197 m<sup>2</sup>
- ◇ Due to growing consumer demand for sustainable buildings, the global market in this industry currently tops \$1 billion
- ◇ The market for sustainable building materials will reach an estimated \$234 billion by 2019

### Increase in LEED-certified building floor area (2010-2014)

	LEED-certified building floor area 2010-2014	Increase in certified building floor area as a proportion of total LEED-certified building floor area		Provincial requirement for LEED certification of public buildings
		2009	2014	
Prince Edward Island	30,957 m <sup>2</sup>	N/A	5.39%	None
New Brunswick	107,463 m <sup>2</sup>	1.12%	3.05%	LEED Silver
Nova Scotia	376,268 m <sup>2</sup>	0.30%	10.74%	LEED Silver
Newfoundland and Labrador	18,900 m <sup>2</sup>	0.80%	1.36%	LEED Silver

Source: Canada Green Building Council



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Green building: a buoyant  
sector

For young people, the building professions are still associated with physically demanding roles and stagnant careers. Those entrenched views overlook a changing industry that **employs qualified recruits trained in environmental initiatives** (HEQ, low-energy buildings, regulations, etc.) **and the climate and thermal engineering sectors** (which support the most advanced constructions, including net-positive energy buildings).

– (Non-exhaustive) list of green building qualifications, under- and postgraduate, and vocational training accessible at <https://www.orientation-environnement.fr/etudes/formations-eco-construction/>

\* Link to the **ADEME guide** for full details on the **financial assistance** available for renovating existing housing in mainland France: <https://www.ademe.fr/sites/default/files/assets/documents/guide-pratique-aides-financieres-renovation-habitat-2018.pdf>

## Challenges



In France, residential and commercial buildings **generate 24% of CO2 emissions and account for 44% of energy usage.**

As we become more aware of our environment and the need to protect it, it's essential to create and promote energy-efficient and ecofriendly housing.

Construction companies are increasingly incorporating environmental concerns into their practices. An example of innovation in the industry: on average, a building meeting current regulations uses nine times less energy than the same building from 1974 and generates three times fewer greenhouse gases.

The authorities and industry stakeholders have recently introduced sustainable construction policies to achieve a significant reduction in environmental sources of pollution from existing and future buildings. The 18 August 2015 Energy Transition Act sets ambitious targets for the sector, including reducing total energy usage. To encourage and accelerate energy renovation work, financial assistance is available\*.

### The three foundations of green building

Energy performance

Ecofriendly housing is designed to deliver substantial savings in heating and electricity via carefully considered architecture, effective insulation, the use of alternative renewable energies, water savings, etc.

Health and wellbeing

Ecofriendly housing has minimal impact on its occupants' health. It's built using nontoxic materials manufactured with the environment in mind. Particular attention is paid to the indoor air quality (in the design, choice of materials and equipment, etc.).

Environmental protection

Ecofriendly housing is designed to reduce the building's negative impact on the environment and biodiversity, when first built and throughout its life, via architecture following bioclimatic principles, the use of natural materials with little or no processing, short supply chains (to avoid overly long and polluting transport), etc. The site should use the least possible energy and generate minimum waste.

# Informations



## Useful links

<https://www.federationhabitateco.fr/> The **Fédération de l'Habitat Écologique** specializes in renewable energy.

<http://www.planbatimentdurable.fr/> The **Plan Bâtiment Durable** regularly publishes studies that provide invaluable insight into public policies on sustainable construction.

<https://www.lamaisonecologique.com/> **La Maison écologique** is France's pioneering green building magazine. Its areas of interest: green building, ecofriendly renovation and biomaterials.

<https://www.materiaux-naturels.fr/> Ecommerce site **selling materials** and natural products for green building and renovation.

<http://maisonbio.info/> Green building **directory** in France (architects, professionals, manufacturers, suppliers, trainers, etc.).

<http://www.batirpourlaplanete.fr> Presents the French Building Federation's (FFB) proposals to deliver the energy transition.

## Tradeshows and conferences

**BEPOSITIVE** BePOSITIVE, which is to be held in **Lyon** (France) from **13 to 15 February 2019**, is the **leading national tradeshow on buildings' and regions' energy and digital transition**. BePOSITIVE 2019 will bring together professionals, construction companies, manufacturers, influencers, distributors, tradesmen and local authorities, providing additional platforms for networking and interaction. By sharing the most innovative solutions, BePOSITIVE aims to encourage synergies, unlock the industries and activate available opportunities in the construction and renewable energy sectors. <https://www.bepositive-events.com/fr>



7<sup>e</sup> Congrès National du  
**BÂTIMENT DURABLE**

The seventh Congrès National du Bâtiment Durable (CNBD) will be held **in Lyon on 17 and 18 October 2018**. The Cluster Eco-Energies and Ville & Aménagement Durable are its co-organizers. The CNBD has become an unmissable event for the construction and regional development sectors on the topic of the energy and environmental transition. <http://www.congresbatimentdurable.com/>

## Orebat: a simplified tool for energy assessments



OREBAT **can be used to estimate the savings generated by renovation work**. The tool is available to the **French Building Federation's (FFB) member** companies and professionals carrying out energy-saving work: insulating opaque walls, installing woodwork and solar protections, ventilation, toilet heating and hot water, regulations and renewable energies, etc.

Orebat **provides an advance estimate of energy usage as well as a simulation of the range of possible work and its performance**. It also produces a report for the client, including a financial assessment.

For optimal use of the tool, **a day's training** is given by the network of FFB training providers. The tool works with Excel. The calculation method considers the residents' behaviours and gives very similar results to their utility bills (targeted difference within 10%).

## Accreditations, certifications and training



Green building is a growing trend around the world. There are various building standards, regulations, certifications and accreditations joining that trend. The certifications centre on energy efficiency, optimization of the materials' lifecycle and environmental quality criteria.

Standards have long been increasing but the demand for certifications and accreditations is more recent and has clearly risen since the Environmental Forum. In fact, both professionals and laymen sometimes struggle to grasp them all. Below is a (non-exhaustive) list of accreditations and certifications.

### For industry professionals:



The Confédération de l'Artisanat et des Petites Entreprises du Bâtiment (CAPEB) launched **ECO-ARTISAN**. The accreditation, which became available nationwide in 2009, recognizes the building professionals who **can provide independent advice on energy efficiency**.



To facilitate the **choice of a qualified professional in energy efficiency matters**, the ADEME (Environment and Energy Management Agency) and the Sustainable Development Ministry created the **reconnu garant de l'environnement (RGE) endorsement**.



The FEE Bat Renove training launched by **EDF** and the **FFB** and **CAPEB** trade bodies in 2007 provides an **opportunity** for construction industry professionals to gain expertise in the energy performance field. The FEE Bat certificate gives **access** to an **RGE** qualification. A **professional with FeeBat certification** is able to advise homeowners on their projects by **recommending** and implementing techniques that contribute to the housing's energy performance.



The **AFPA** (Association pour la formation professionnelle des adultes) provides several short **training courses** (two to five days) aimed at building professionals in the section: **Formations Métier sur la Performance énergétique**.

### For buildings:



A passive home refers to housing with very low energy usage. **Bâtiment passif accreditation** is the French version of Europe's "Passivhaus" standard. It includes numerous technical specifications on windows, the insulation and airtightness of walls, air renewal, etc. Very strict tests are conducted to obtain passive house accreditation. Passivhaus-accredited buildings can **save up to 90% of energy versus a standard building**.



**HEQ** (high environmental quality) isn't a regulation or accreditation, but a quality initiative based on a 'reference framework' with **fourteen targets incorporating environmental requirements** into construction, renovation and regional development projects.



**BEPOS stands for Bâtiment à Energie Positive**. BEPOS accreditation is a benchmark in the positive-energy building construction industry. Buildings that have it are **very economical over the long term** as energy usage is offset using thermal optimization and energy production systems. The building **can also return the energy that it generates to the network**.



## Point Info Energie



**Points Info Energie (PIE)** are **local information and advice structures on energy efficiency and renewable energies**. Available nationwide since 2001, they were developed by the ADEME **in the aim of pooling knowledge on improving buildings' energy efficiency**.



The PIE offer a **service to individuals and companies** seeking to carry out construction or renovation work by providing **technical and financial support** throughout their project.

The information and assistance services are free, and energy diagnostics are paying. Energy advisors can, for example, provide information on insulation materials, the choice of heating system, renewable energies, simple ways to save water and energy, etc. They can also provide details of **the financial assistance available** for construction and renovation projects.

On St-Pierre and Miquelon, a Points Info Energie will be launched shortly. The project will represent a major step towards better energy management across the area.

The service, which has been outsourced to the Collectivité Territoriale development agency, forms part of a comprehensive environmental protection and anti-climate change strategy. It has two main aims:

- driving the area and its people towards greater energy efficiency,
- progressively reducing the use of fossil fuels.

For more information, you can contact Jérôme LE DÛ, Head of Operations at Archipel Développement, at [jerome.ledu@archipel-developpement.fr](mailto:jerome.ledu@archipel-developpement.fr)

## 3D construction

**Bâtiprint 3D** is an innovative system developed at the **University of Nantes** which uses 3D printing to build the walls of a home directly onsite and in just a few days, thereby reducing the timeframes, pollutions, difficulties and costs. Nantes City Hall has just launched the first social housing, a 95-sq. m home called **Yhnova**, built using the innovation.

Yhnova isn't the first printed home as 3D construction printing is available in several other countries. However, the **Bâtiprint** process is unique because it involves three layers of materials using a multi-joint industrial robot: two layers of expansive foam provide formwork for a third layer of concrete. Once the walls are up, the polyurethane foam remains in place to insulate the housing with no thermal bridge.

For more information: <http://batiprint3d.fr/>

A conference on Bâtiprint 3D technology will be held at the eco-materials tradeshow in Quebec this 24 October: <http://www.rendezvousdesecomateriaux.com/>

# INTELL-ECHO



Are you seeking business opportunities in this sector?  
CACIMA and PROVIS can facilitate your business prospection process and help with establishing new partnerships  
(targeted information and network contacts)

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