



Vivir Mejor

# SUSTAINABLE HOUSING IN MEXICO



GOBIERNO FEDERAL

SEMARNAT



COP 17

SIF

SOCIEDAD HIPOTECARIA FEDERAL



INFONAVIT



CONAVI

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# EXECUTIVE SUMMARY

## Relevant facts

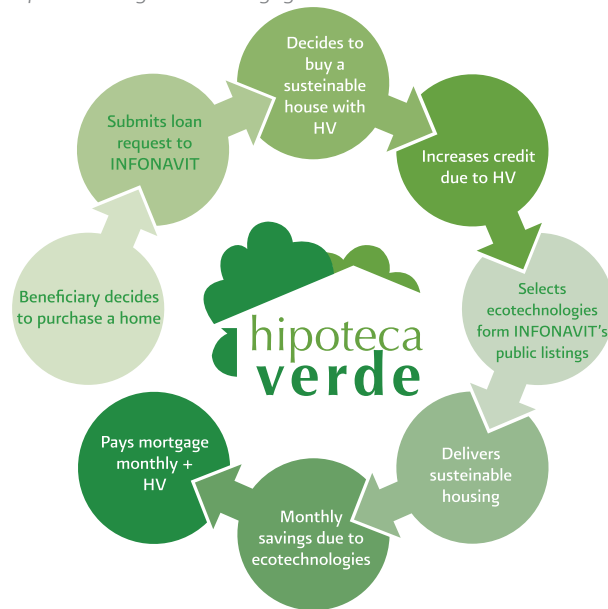
- By the third decade of this century, there will be 40 million homes in Mexico, and an average of 0.6 million will be constructed and financed each year..
- In the next 30 years, 35 percent more houses than those currently existing in Mexico will be constructed.
- Urban areas consume nearly 50 percent of the country's energy resources.
- To date, nearly 500,000 sustainable houses have been built in Mexico. Each of them has mitigated 1 to 1.5 tons of CO<sub>2</sub>e.
- HMore than 243,626 subsidies have been given under the "Esta es tu casa" program
- Five Sustainable Integrated Urban Developments (Desarrollos Urbanos Integrales Sustentables, DUIS) have been certified and 18 are currently being analyzed (which represent more than 1 million 250 thousand new houses in 15 Mexican states).

## Description

Since 2009, the Mexican Federal Government has promoted the development of a sustainable housing model. The precursor of this initiative was the Green Mortgage (Hipoteca Verde, HV) program of the Institute of the National Housing Fund for Workers (Instituto Nacional del Fondo para la Vivienda de los Trabajadores, INFONAVIT), an institute in which Mexican workers save a portion of their salaries and employers make another contribution in order to generate creditworthiness for the purchase of a home. The HV consists of equipping the home with a technology package for the sustainable use of water and for energy saving (electricity and gas), making it possible to achieve a 48 percent savings in electricity and gas consumption. Electricity, water and gas bills are reduced, which mean an average savings of 261 MXN for residents of affordable housing. In the case of carbon dioxide (CO<sub>2</sub>e) emissions, it is estimated that each home saves 1 to 1.5 tons per year. In addition, the "This is Your House" ("Ésta es tu Casa") program, through federal subsidies, has helped low-income families (< 2.6 TMW) that are not eligible for an HV credit to afford a sustainable house. With these instruments, the aim is to strengthen the Government's commitment to offer the alternative of sustainable housing to the country's lowest income sector.

## Green Mortgage (Hipoteca Verde, HV)

Chart for obtaining Green Mortgage



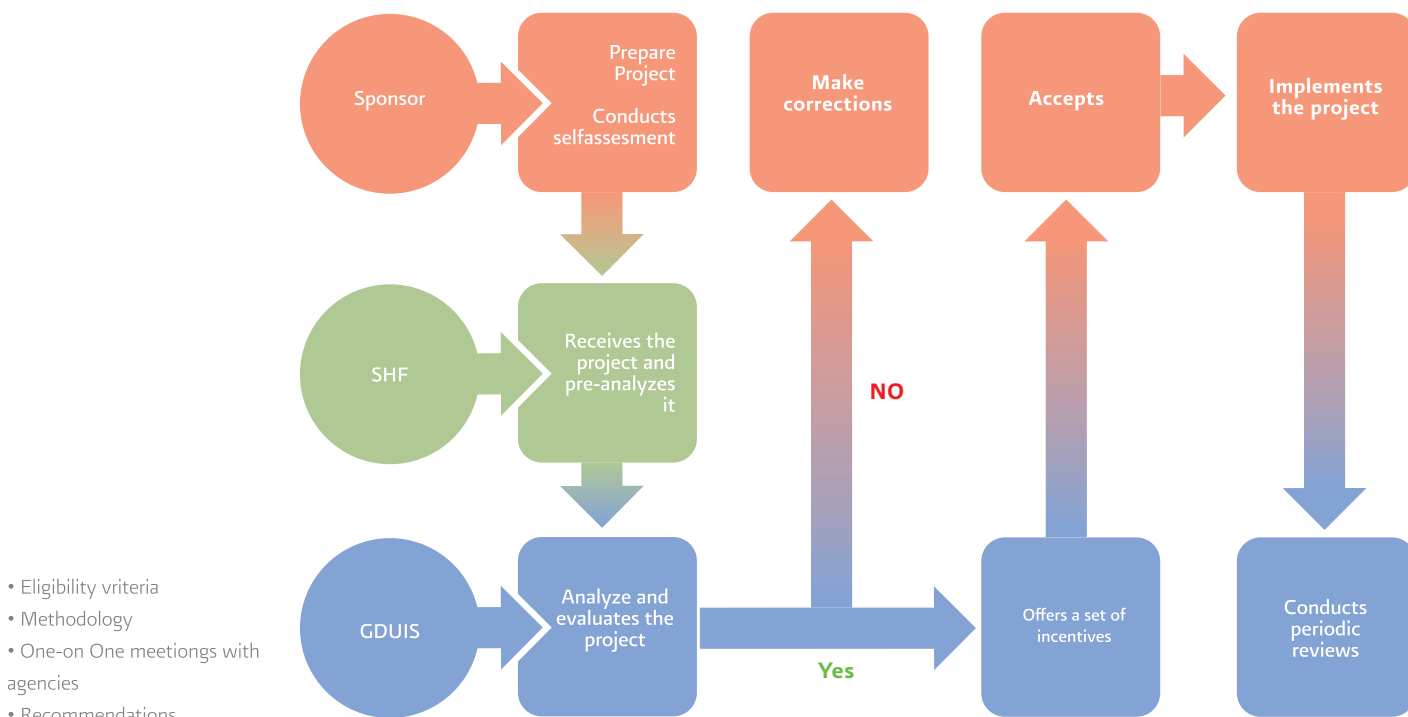
The economic benefits that the HV generates for families are directly related to the technology package that they select. Depending on the income evaluated by the minimum wage (times minimum wage, TMW, or veces salario mínimo, VSM), a range of minimum savings is established, which ensures minimum savings for a family's economy.

There is a federal government subsidy called "This is Your House": it is an extra amount added to the credit granted by INFONAVIT. It allows low-income families (<2.6 TMW) to purchase a sustainable house.

## Sustainable Integrated Urban Development (DUIS)

This addresses the concept of sustainable housing under a broader scope that encompasses the neighborhood, the city and the region and takes the following aspects into consideration:

- Efficient and sustainable urban infrastructure
- Integration of industry and commerce to allow employment creation in the region
- Strategies to facilitate mobility and accessibility
- Provision of services: education, health, social activities
- Territorial coordination
- Environmental protection and rational use of natural resources



- Eligibility criteria
- Methodology
- One-on-One meetings with agencies
- Recommendations

## Initiatives to Strengthen Sustainable Housing in Mexico

In order to strengthen the efforts that have been made on this subject, work has been conducted on the design and implementation of mechanisms stemming from relevant international agreements on climate change. The mechanisms that are planned to be promoted are: Clean Development Mechanism (CDM), and Nationally Appropriate Mitigation Actions (Acciones de Mitigación Nacionalmente Adecuadas, NAMAs) for Housing and Urban Development.

International support for the achievement of the objectives proposed by these initiatives has included the participation of the World Bank and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, BMU), through the German Agency for International Cooperation (GIZ, as per its acronym in German), which have contributed economic and human resources to strengthen the efforts and commitments expressed by Mexico on this subject in order to achieve favorable results in the implementation of the initiatives and a significant reduction in GHG.

## I. MEXICAN HOUSING <sup>1</sup>

Housing is a basic need. It provides safety, peace of mind and stability to an individual, and for some it is a key element in fighting poverty.

In Mexico, the Federal Government is in charge of implementing most of the support (soft credits) granted to the population for home purchases, through contributions by employers and employees in proportion to the work performed. The key institutions that grant these supports/

credits are INFONAVIT and the Housing Fund of the Institute of Social Security and Services for Government Workers (Fondo de la Vivienda del Instituto de Seguridad and Servicios Sociales de los Trabajadores del Estado, FOVISSSTE), which contribute 80% of housing credit and therefore contribute toward increasing the availability of homes for low-income families.

The housing finance industry in our country offers consumers long-term mortgages for the purchase of a home. These credits typically have terms of 15 to 30 years. The type and price of the products financed depends mainly on sources of financing and the individual's creditworthiness.

Mortgages for low-income housing have been tied to the specific income of the mortgagee. For example, loans issued by INFONAVIT foresee that mortgagees may lose their jobs—their source of payment—and thus contain grace periods of slightly more than one year.

Mexico has experienced significant growth in its efforts to construct low-income housing, and the credits that have been granted in recent years have greatly exceeded those of previous years. This industry is expected to continue growing exponentially in the coming years. "Housing, architecture, urban development, financing and markets are now the variables of an equation that will define the future of our cities." **Sara Topelson Fridman. Deputy Secretary of Urban Development and Land Use Planning. Secretariat of Social Development. Federal Government.**

The challenge will be to consolidate the industry and confirm achievements and efforts. The Government of President Felipe Calderón has granted more loans and subsidies for housing each year than all previous governments: more than 1 million on average, with approximately 6 million expected in 2012.

<sup>1</sup> For more information, see:

Article: "La Vivienda en México" ("Housing in Mexico"). Patricio de la Fuente.

Resumen V Informe de Gobierno (Summary of Fifth Governance Report). President Felipe Calderón Hinojosa. Apartado Vivienda (Housing Section).

Housing cannot be viewed as a passing phase or as a sector that can be improvised year after year. Instead, it is a trigger of economic growth and social justice in virtue of the housing needs presented by the country's demographic structure. It is a highly specialized activity that requires decisive businessmen and recognition as a long-term activity.

It now seems natural to point to the housing industry as the star of the country's economy, but it is very important to provide it with security in terms of policy stability, cross-cutting policy, goals, new construction models (sustainable housing) and commitments by key actors in order to be effective. This is the key challenge.

## II. SUSTAINABLE HOUSING: A CONCEPT ADOPTED BY THE NATIONAL HOUSING COMMISSION IN MEXICO <sup>2</sup>

Housing and urban systems play a significant role in the potential for mitigating greenhouse gas (GHG) emissions, because urban settings consume nearly 50% of energy resources. Housing demand and urban sprawl are growing steadily and their development must be incorporated in a policy of integration that allows for balanced development while ensuring the sustainability and ongoing improvement of residents' quality of life.

Therefore, the current administration's efforts have been focused on the development of various initiatives to integrate, both in urban settings and in housing, best practices that serve as a model at global level:

The Green Mortgage (Hipoteca Verde, HV) enables the purchase of housing with ecological and technological solutions for energy efficiency and renewable energies, such as solar heaters, energy-saving lamps, water-saving valves, thermal isolation, high-efficiency air conditioners, etc.

Sustainable Integrated Urban Developments (Desarrollos Urbanos Integrales Sustentables, DUIS) are comprehensively planned areas that address the demand for housing and constitute support for economic projects that generate employment for the region, focusing on sustainability and providing more orderly development. Their strategy promotes the diversity of soil uses and of types of housing. It is a requirement that 40% of social housing under DUIS be eligible for subsidies under the "This Is Your House" ("Esta es tu Casa") program, whose purpose is to grant economic support to low-income people for the purchase of new homes with sustainable technologies defined in a basic package that includes gas, electricity and water.

The first challenge to overcome will be to meet the demand for housing in Mexico; taking into account demographic growth rates, the country will have an estimated 160 million inhabitants by 2050. By the third decade of this century, Mexico will have nearly 40 million households, and over 0.6 million houses will need to be built and financed each year.

<sup>2</sup> For more information, please see:

Article "Housing, Sustainability and Urban Development" (Vivienda, Sustentabilidad y Desarrollo Urbano). Bitácora de Vivienda volumen 2. Cámara Mexicana de la Industria de la Construcción. Dr. Gabriel Quadri de la Torre. Dir. Asoc. de Sistemas Integrales de Gestión Ambiental, S.C.

Article "All Roads Lead to" (Todos los caminos llevan a Cancún). Bitácora de Vivienda volumen 2. Cámara Nacional de la Industria de la Construcción. Dr. Jorge León Wolpert Kuri. Subdir. Gral. de Sustentabilidad. Comisión Nacional de Vivienda. Gobierno Federal.

The second challenge will be to resolve urban development issues. New urbanizations must be planned, infrastructure and public transportation must be introduced, and then housing must be constructed with an essential mix of land uses, civic and recreational areas, and connectivity with the rest of the city. This is not currently considered in Mexico. Until now, new developments have been located on cheap rural lands, with no planning. First, unconnected sites are populated, forming a disorderly pattern of dysfunctional patches on the land, with impersonal housing that lacks spaces for coexistence and recreation. Next, services are introduced and public transportation arrives under irregular conditions. Isolation makes travel costly.

Without access to urban space per se, without integration and identity, and without a vibrant social fabric, new housing developments spring up and then deteriorate, and housing is sometimes even abandoned.

Although there have been commitments between the Federal Government and individuals involved in the production and financing of housing in order to address these challenges, countless areas of opportunity remain.

## III. THE FEDERAL GOVERNMENT'S PUBLIC HOUSING POLICY <sup>3</sup>

### 1. Improve public and private management on behalf of sustainable housing

It is necessary to develop instruments and mechanisms to create greater coordination by the three levels of government with the social and private sectors in order to consolidate a single viewpoint of the public policy on sustainable housing in the country. This effort involves the public and private sectors, as well as the intervention and collaboration of executive and legislative authorities of the different levels of government. Consolidating this objective implies working together with the Federal Government agencies involved and establishing a work agenda through the committees envisaged by the National Housing Council, the appropriate agency for coordination and collaboration among sectors.

In addition, the aim is for local governments to adopt, in their regulatory frameworks, criteria for land-use planning, urban planning and sustainable housing, not only to align them with the National Housing Policy but also as part of a strategy of assuming leadership on these matters. Another task is to promote and encourage the adjustment and modification of laws, regulations or specific rules that make it possible to continue with the agenda proposed in the 2008–2012 National Housing Program.

For Mexico, the year 2009 presented an adverse scenario in the housing sector, due to a serious mortgage and financial crisis in the United States in 2008, which affected the real estate dynamics that had been in place since the second half of 2007. Stemming from this, prospects for the housing sector in Mexico were not very optimistic. The different scenarios formulated by experts were in agreement that the international financial crisis would



be reflected in an increase in housing prices, in a decrease in investments in the sector, and in an increase in mortgage interest rates. This uncertainty was reflected not only in major decisions by investors throughout the country, but also in the initiatives of families with regard to buying a house: even though they had the resources, they opted to wait for better times and more favorable prospects. In this context, for the first time in decades Mexico undertook a series of decisive actions, including fiscal and monetary policies, to mitigate the effect of the crisis on the well-being of Mexican families, as observed in the lack of financing, the decrease in formal employment, the reduction in exports, the drop in housing production, and the increase in housing inventories. Thus, the measures implemented sought to lay the foundations for solid, ongoing recovery.

In contrast with what occurred in 2009, in 2010 the economic environment was more favorable. According to the "General Economic Policy Criteria for 2011," in the first half of 2010 the Gross Domestic Product (GDP) grew at an annual rate of 5.9%. Most productive activities showed better performance than that observed the previous year. Starting in 2010, firmer signals are marking the start of a new stage of growth in the housing industry, albeit in a gradual and heterogeneous manner, with some regions of the country and housing sectors progressing more quickly than others.

The timely indicators of the industry show a clear upswing with regard to 2009, although still below the levels observed in 2008 when the sector registered historical high levels. The global financial and economic crisis, which was transmitted to the housing industry through decreased access to financing, as well as risk aversion, made sources of funding more costly for intermediaries and for housing developers. After a difficult 2009, the housing industry is showing positive signs of the start of a new stage of recovery and growth. Except for the Sofoles and Sofomes, whose participation in mortgage financing decreased from 22% in 2007 to only 7% in 2010, and financing for construction companies which decreased from 39% in 2008 to 15% in 2010, financing in Mexico was not interrupted during the economic slowdown. Public housing institutes and agencies such as banks kept credit lines open (although they issued loans more selectively). In both cases, the restraint came from demand rather than from the availability of credit. In this crisis, Mexican banks were in a better situation than that of 1995. Almost no bank experienced major problems so that, unlike what happened in 1995, a large part of mortgage loans could be saved.

Two indicators that showed recovery in 2010 were the housing inventory and the number of construction works started in the Consolidated Housing Registry (Registro Unico de Housing, RUV). The inventory of housing ready for sale showed 370,000 units at the end of November, which represented an annual variation of 14.1%. The recovery of inventories took place mainly in housing with values of up to 250,000 MXN (20.6%), while those with higher values remained depressed. In turn, the records of work start-ups in the RUV, which considers new housing that is displaced through credits associated with the Institute of the National Housing Fund for Workers (Fondo Nacional de la Vivienda para los Trabajadores, INFONAVIT), the Housing Fund of the Social Security and Services Institute for State Workers (Fondo de la Vivienda del Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado, FOVISSSTE) and the Federal Mortgage Company (Sociedad Hipotecaria Federal, SHF), ended 2010 with over 493,000 records, representing an annual variation of 11.1%.

In response to housing needs in our country, to the conditions prevailing in the sector, and to the commitments made on this matter, following the enactment of the new Housing Law in June 2006, CONAVI became a decentralized, non-sectoral agency of eminent domain and social interest, with legal status and its own assets, responsible, among other things, for formulating, executing, conducting, evaluating and monitoring the National Housing Program and the national program on this subject.

The National Housing Commission, in its role as the sector's coordinator and in fulfillment of the authority and obligations assigned to it by the Law, develops a set of actions to plan, along the same lines, the efforts of the different actors in the housing process. Changes were promoted to give the National Housing Policy and institutional efforts a new turn, in which strategies were included to address those families that were not wage earners and lacked access to credit, and to integrate urban development policies with those of housing and land.

The current housing policy, based on the major guidelines of the 2007–2012 National Development Plan (Plan Nacional de Desarrollo), was summarized in the four objectives of the 2008–2012 National Housing Program (Programa Nacional de Vivienda, PNV): "Toward Sustainable Housing Development", on which progress has been achieved and new challenges are being faced.

## 2. Objectives of the 2008–2012 National Housing Program:

### a) Increase the coverage of financing for housing offered to the population, particularly for low-income families.

The aim of this objective is to expand the coverage of the different financing programs and guarantee the universal nature of this right, as stipulated in Article 4 of the Constitution, since 1983. With this objective, credit options have been expanded for the wage-earning population who are legal beneficiaries (derechohabientes) of a housing fund, by allowing the combination of resources from their housing funds, with their own savings and for the first time the option of a loan from a private financial institution and even to receive a Federal Government subsidy.

Thus, through credit schemes that are more accessible to the wage-earning population, the increase in financial resources and sources, and the participation of new specialized agents, the coverage of this segment of the population has increased. There is currently a wide array of options for credit, such as a beneficiary of INFONAVIT who can request support from INFONAVIT, cofinancing, joint credit, and the "This Is Your House" ("Ésta es tu Casa") program; while a beneficiary of FOVISSSTE, in addition to the subsidy, can also access the programs this institution has.

Through the "This is Your House" subsidy program, support is granted for the purchase of a lot, a new or used house, for self-producing or improving one's house, as a means of helping to consolidate the assets of these households.



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## **b) Promote sustainable housing development.**

To implement this objective, three key components of the public policy on sustainable housing were agreed upon:

1. Land-use planning
2. Urban planning
3. Construction of sustainable housing.

### ***Land-use planning***

The public policy on housing has two priorities under the category of land-use planning. First, to facilitate urban redensification in order to avoid the unplanned growth of cities. The objective for land already within the cities that already has urban infrastructure and can use existing equipment, should reach the optimum level of saturation before continuing to physically expand. In this regard, together with the Secretariat of Social Development, CONOREVI, INFONAVIT, FOVISSSTE, SHF and UNAM, CONAVI published the Guide for Housing Redensification in the Inner City, so that local governments would have the necessary legal and fiscal elements to promote urban redensification through their regulatory frameworks. In addition, incentives were aligned in order to redirect housing production toward a denser construction model. In particular, the operating rules of the “This Is Your House” subsidy program were modified to encourage vertical housing (three or more inhabitable floors) starting in early 2011. A second priority, in recognition of the fact that urban redensification is not always viable in all cases, is the planned expansion of cities. In other words, there should be prior planning in terms of how far out this expansion will occur, thus optimizing the investment in urban infrastructure and equipment in order to achieve the planned growth of cities which will also give rise to better housing, better communities and better quality of life for residents. For this purpose, initiatives have been triggered aimed at strengthening regional and urban planning through the use of the Agencia Cero Planning Model. This concept implies the creation of a land-use planning unit based on the potential for regional economic development. CONAVI seeks to balance this model with sustainable urban planning based on the redensification and compacting of cities, prior to the planning of efficient growth.

### ***Urban planning***

The most significant progress in urban planning was the consolidation of Sustainable Integrated Urban Developments (Desarrollos Urbanos Integrales Sustentables, DUIS) as an instrument of the public housing policy in order to contribute to land-use planning through housing construction. In 2011, there are five authorized DUIS projects and 18 under review, representing over 1,250,000 houses in 15 federal entities (states and Federal District). This initiative has made it possible to align the incentives of federal, state and municipal authorities with the interests of the private and social sectors in order to develop new housing using standards for land-use planning, urban planning and the construction of sustainable housing. In addition, under the Sustainability Committee of the National Housing Council, the use of the “Qualitative Assessment” (“Avalúo Cualitativo”) was approved.

This is a methodology developed by INFONAVIT that estimates the level and quality of urban facilities in a housing development, thus giving rise to a new measurement of the housing complex’s quality, not just of housing. With this type of initiatives, the aim is to empower the end-user to be an increasingly more informed, and thus more demanding, purchaser, not only of the type of housing he or she is seeking but also of the environment that is best suited to his or her needs. CONAVI supports the strengthening of DUIS and promotes a new model of housing production that includes vertical construction for better use of urban infrastructure and services.

### ***Construction of sustainable housing***

Since 2009, there has been a synergy between INFONAVIT’s Green Mortgage program and the eligibility criteria of the “This is Your House” program; the federal subsidy for the purchase of new homes required housing to have a basic package of eco-technologies for the sustainable use of water and for energy saving (electricity and gas). This initiative made it possible to finance over 105,000 Green Mortgages. Of these, 67,256 were with subsidies from the “This Is Your House” program (64%). As of October 2010, nearly 113,000 of these mortgages had been financed; of these, 58,410 were with subsidies (52%). As benefits, the Green Mortgage makes it possible to obtain a 48% savings in electricity and gas consumption. Electricity, water and gas bills vary from 186 to 366 MXN per month, which mean an average savings of 261 MXN pesos for residents of affordable housing. In the case of carbon dioxide (CO<sub>2</sub>) emissions, it is estimated that each house saves 1 to 1.5 tons per year. With these instruments, together with the Housing Construction Code, the aim is that, in the medium term, the municipalities themselves will adopt these guidelines in local regulations for construction permits.

## **c) Consolidate the national housing system through improvements in public management.**

The strengthening of public management, which CONAVI is promoting, occurs both transversally and vertically, through Federal Government agencies and through different levels of government. With regard to Federal Government agencies, institutional strengthening is promoted through participation in its government agencies and coordination authorities. For the purpose of encouraging sustainable housing development, the “Criteria and Indicators for Sustainable Housing Developments” are updated in conjunction with agencies specializing in water, energy and solid waste. These criteria will serve as the basis for the preparation of a National System for the Evaluation of Sustainable Housing. With regard to federal entities, the aim is to standardize the state regulatory framework so that individual financing and housing production are triggered in each federal entity. Regulatory alignment and operational efficiency are also sought; these include the formulation of state housing laws, construction regulations,

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modernization of public property registries and cadastres, and adoption of the Guide for Housing Redensification in the Inner City. The challenge is to achieve the modernization of these regulatory instruments in all federal entities.

## **d) Consolidate a Federal Government support policy that helps the low-income population to obtain financing for housing and promotes sustainable housing development.**

The aim of this objective is to respond to the low-income population that is seeking a solution to its demand for housing, and to address the population that produces housing for its own consumption but requires support and advice to improve the quality of its homes.

The oldest form of housing production is that which the population does by its own means and is what the Housing Law defines as Social Production of Housing (Producción Social de Vivienda, PSV).

The Assisted Social Production of Housing is the social production of housing conducted with the support of qualified specialists, builders and private social developers. It encompasses technical, financial, organizational, training and management aspects suited to the characteristics of the process and of users. The assistance is partial when it only addresses several aspects, and is comprehensive when it addresses all of them. Thus, it is important to promote assisted social production, certify Social Developers of Housing (Desarrolladores Sociales de Vivienda, DSV), and improve the intervention of executing agencies through training. Despite its limitations, the PSV has numerous advantages for resolving the needs of the low-income population if it is accompanied by adequate advice and financing.

Another of the cross-cutting aspects that support this objective of the National Housing Program (Programa Nacional de Vivienda, PNV) is the Subsidy Policy, which is also of a cross-cutting nature within the PNV, and which operates through the "This Is Your House" program. Since its creation, this program has helped beneficiary and non-beneficiary families who earn incomes equivalent to four minimum salaries. Its operation has been based on a strategy of complementarity between these Federal Government strategies and the financing granted by national housing agencies and private financial institutions, so that these families can purchase, improve, self-construct or acquire a lot with services.

"This Is Your House" has become the principal instrument for encouraging and implementing a public housing policy. In addition to the abovementioned support to the low-income population that demands housing solutions, through these subsidies it has been possible to promote the following strategies:

### **Financing for PSV a la PSV**

This type of housing production is funded by the subsidy program for the purchase of a lot with services, for making home improvements, or to self-construct a house. The beneficiary of a subsidy for a lot may complement this with another subsidy for self-construction of a house.

### **Sustainable housing**

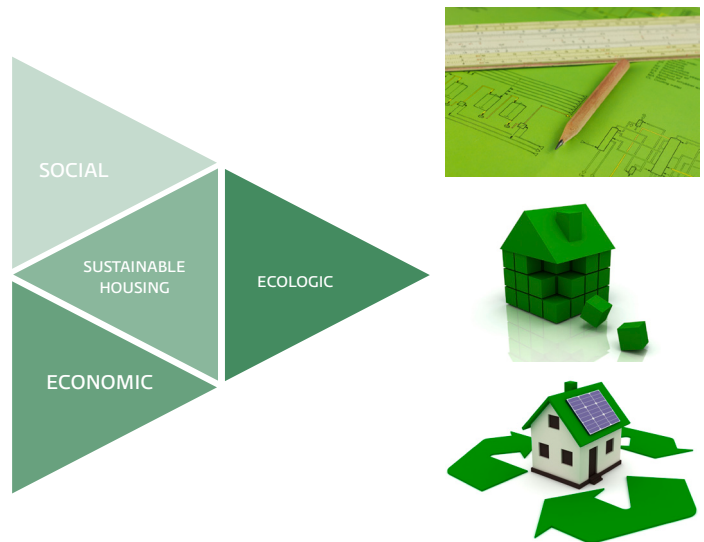
The operating rules of the "This Is Your House" program promote the construction of sustainable housing, in compliance with stipulations in the basic package defined by the Technical Evaluation Committee, encompassing urban aspects, efficient use of energy and water, adequate management of solid waste, and social aspects.

### **Two for one**

In coordination with federal entities, work is conducted jointly to boost the resources allocated by CONAVI, so that for every two MXN that the state government contributes in cash as subsidies to beneficiaries of the "This Is

Your House" program, CONAVI will contribute one MXN in addition to those allocated in the entity.

With all of this, the evolution of the sector as a whole has been positive. In 2010, a total of 1,116,022 housing initiatives (credits and subsidies) were granted. This represented an investment of 241,423 million MXN, which is 2% above the investment made in the previous year, according to preliminary figures.



SOURCE: NATIONAL HOUSING COMMISSION

## **IV. SUSTAINABLE HOUSING**

A constructed house is considered, taking into account sustainability aspects such as bio-climate design and energy efficiency, the latter through the incorporation of sustainable technologies defined in a basic package referring to gas, electricity and water, in order to obtain savings in energy consumption, in payments for utility services (gas, electricity and water), and in CO<sub>2</sub>e emissions. The aim is to integrate the productive chain associated with housing production in order to consider the carbon footprint of the housing life cycle, which includes the manufacturing of construction materials, their transportation, the process of building and equipping housing developments and houses, as well as their operation during their useful life.

The growth of the housing sector in Mexico over the past decade has been positive in terms of financing, domestic market promotion, and most importantly access to housing. Efforts have been made to strengthen the supply of sustainable housing in Mexico, which has not been possible on a mass scale, if one takes into account the fact that most housing developments continue to lack minimum efforts related to sustainability.

In theory, an ideal, sustainable housing development would be:

- Profitable as a business model and profitable for the country in terms of generating employment and public finances;
- Ecologically friendly in terms of greenhouse gas emissions

(GHG) throughout the productive chain, which involves the construction and inhabiting of housing. Proper use and re-use of water and solid waste treatment; and

- A trigger for better community life, which means lower expenses for the families who live there, for transportation to their workplaces, and the operations of the home (electricity, water, gas) and adequate urban facilities and access to health services, recreation, commerce and food supplies, and especially education on the topic of sustainability.

In the past three years, sustainability efforts have been promoted in the housing sector, focused on integrating eco-technologies in housing. These efforts have led to the implementation of programs such as INFONAVIT's Green Mortgage (Hipoteca Verde, HV) program, supported with federal subsidies ("This Is Your House" – CONAVI).

## 2011 Sustainable Housing Expectations of the Housing Sector







**2011**

• **765,000 mortgages**

• **265,000 subsidies**

• **Investment range between: US \$ 21,000 to US \$23,000**

• **Infonavit and Fovissste will provide 7 out of 10 mortgages**

	Entity	Baseline	Scenario	Likely	Scenario
		#	\$	#	\$
Mortgages		480,000	8,692	515,000	9,987
		90,000	2,450	100,000	2,722
		158,600	8,520	161,910	8,907
	Other entities	36,099	318	36,099	318
	<b>Sub Total</b>	<b>764,699</b>	<b>19,962</b>	<b>813,009</b>	<b>21,934</b>
Subsidies		170,000	430	170,000	430
		94,825	182	94,825	182
	<b>Sub Total</b>	<b>264,825</b>	<b>612</b>	<b>264,825</b>	<b>612</b>
	<b>Total</b>	<b>1,029,551</b>	<b>20,574</b>	<b>1,077,861</b>	<b>22,548</b>
		81,575	449	81,575	449
	<b>Grand Total</b>	<b>1,111,123</b>	<b>21,023</b>	<b>1,159,436</b>	<b>22,995</b>

SOURCE: NATIONAL HOUSING COMMISSION

## V. CONCEPTS OF SUSTAINABLE HOUSING IN MEXICO

### 1. The Green Mortgage: A product of the Institute of the National Housing Fund for Workers (INFONAVIT)<sup>4</sup>

INFONAVIT is a tripartite Mexican institution in which the labor sector, the business sector and the government participate. Its aim is to issue loans to workers to obtain housing and provide yields to savings in the National Housing Fund for retirement pensions.

#### a) Green Mortgage (HV)

This is an additional loan amount granted to an INFONAVIT beneficiary when purchasing a house with eco-technologies that generate savings in water and energy consumption, thus making the beneficiary better able to pay.

Geographic Area	MXN
A	59.82
B	58.13
C	56.70

<sup>4</sup> Based on information, documents and presentations provided by INFONAVIT. For further details please refer to: [www.infonavit.gob.mx](http://www.infonavit.gob.mx).

Loans to workers are granted in terms of the minimum salary that they earn. The minimum salary is the legally established wage for each work period (day), which employers must pay to workers for their efforts. In Mexico, there are different salary categories by geographic area:

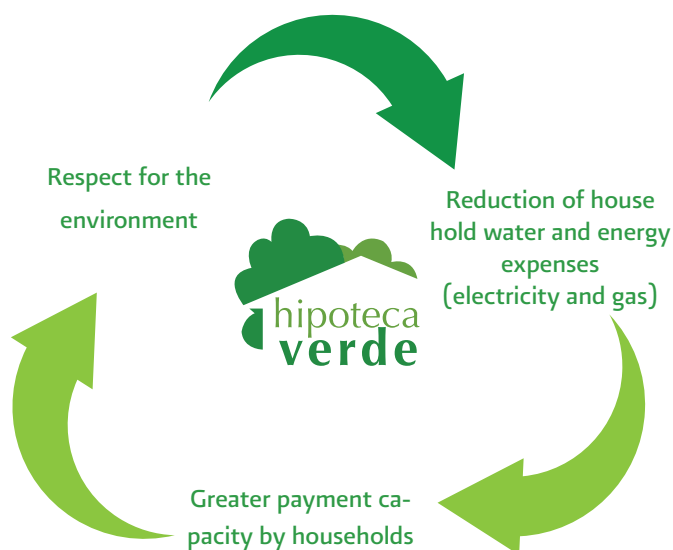
Furthermore, in accordance with Federal Government instructions, which stipulate that all new houses benefiting from the federal subsidy program "This Is Your House", granted by the National Housing Commission (CONAVI), since 2009 must have eco-technologies installed in order to reduce water and energy consumption. For this reason, CONAVI and INFONAVIT agreed to merge the additional resources of the Green Mortgage and the federal subsidy so that workers earning minimum wages could increase their purchasing capacity. Since that date, 148,980 workers have benefited from both resources.

## b) Objectives

1. To contribute to the National Strategy for Climate Change through the promotion of available housing with ecological criteria.
2. To provide adequate conditions and encouragement for INFONAVIT beneficiaries to be able to purchase houses with higher values due to the use of innovative technologies aimed at decreasing water and energy consumption.
3. To provide collateral benefits to housing developers that seek differentiation, as well as to the eco-technology industry and the community in general.

## c) Benefits of the HV

- Reduction in household expenses for electricity, gas and water consumption, thus increasing these customers' payment capacity
- Improvement of environmental quality through decreased CO<sub>2</sub>e contamination
- Assurance of natural resources for future generations
- Encouragement of a culture of saving and of respect for the environment Better quality of life



Source: INFONAVIT

## Minimum Wages vs. Additional Credit for HV

INCOME 1			Required minimum monthly savings	Additional amount of credit	
TMW	From	to			
1 to 6.99 TMW	\$1,818.53	\$12,729.69	\$215.00	10 TMW	\$18,185.28
7 A 11 TMW	\$12,729.70	\$20,003.80	\$290.00	15 TMW	\$27,277.92
11 TMW EN ADELANTE	\$20,003.81	AND ABOVE	\$400.00	20 TMW	\$36,370.56

1 DAILY WAGE INTEGRATED IN MXN PESOS

TMW: TIMES MINIMUM WAGE

Source: INFONAVIT

## d) Eco-technologies

The eco-technologies that have been incorporated in this program to date and can be selected are listed below:

### Lighting

- Energy-saving bulbs (compact fluorescent lamps)
- High-efficiency or low-consumption air-conditioning equipment (1 or 1.5 ton)
- High-efficiency refrigerators (INFONAVIT does not finance refrigerator purchases)
- Thermal isolation on roofs
- Thermal isolation on walls
- Reflective coating as a finish on roofs
- Reflective coating as a finish on walls

### Gas

- Flat solar water heater with the backup of a gas heater with a valve for rapid recovery.
- Solar water heater with evacuated tubes, with the backup of a gas heater with a valve for rapid recovery
- Gas water heater with a valve for rapid or instant recovery

### Agua

- Toilet with a maximum of 6 liters per flush
- Ecological-grade toilet with a maximum of 5 liters per flush

- 
- Ecological-grade shower with an integrated water-saving device
  - Faucet (valve) with water-saving device in bathroom sink
  - Faucet (valve) with water-saving device in kitchen
  - Regulating valve for water flow in water pipes

## Health

- Water purification filters, with two spare filters included
- Provision of purified water in homes

## e) Bio-climate regions and eco-technologies

Due to its geographic situation, Mexico has a large diversity of bio-climate regions. Ten different bio-climate regions are recognized, in which the principal cities of the country's 32 states are catalogued:

1. Dry hot
2. Extremely dry hot
3. Semi-humid hot
4. Humid hot
5. Dry semi-cold
6. Semi-cold
7. Humid semi-cold
8. Dry mild
9. Mild
10. Humid mild

Habitability needs and standards of comfort for users vary depending on the bio-climate regions. The following list shows the eco-technologies applicable to each region:

- **Hot:**
  - o Thermalisolationonroofsandwalls
  - o Low-energy lamps
  - o Water-saving equipment
  - o Heater with valve
  - o Air conditioning

- **Semi-cold:**

- o Solar water heater
- o Thermalisolationonroofsandwalls
- o Low-energy lamps
- o Water-saving equipment

- **Mild:**

- o Solar water heater
- o Low-energy lamps
- o Water-saving equipment

## f) Estimated savings per family

The eco-technologies eligible for the Hipoteca Verde are directly associated with workers' incomes (minimum wages) and the estimated amount of monthly savings that the implementation of these measures will generate.

Income (integrated salary)		Minimum monthly savings	Additional amount of credit up to:
\$1,818.53	\$12,729.69	\$215.00	\$18,185.28
\$12,729.70	\$20,003.80	\$290.00	\$27,277.92
\$20,003.81	EN ADELANTE	\$400.00	\$36,370.56

Source: INFONAVIT

## g) INFONAVIT 2011

For its part, INFONAVIT will finance the purchase and installation of different energy-saving accessories, for which an amount in addition to the maximum amount of the original loan will be granted. This additional amount for eco-technologies will be the lesser between the amount that the institute identifies for the beneficiary and the cost of the eco-technologies installed in houses, as an evolution of the prior Green Mortgage.

With the support of USAID, a study is being coordinated to calculate the savings generated by these eco-technologies, taking into account information from:

- Study Evaluation and Measurements 2009, 2010 and 2011 (Enervalia)
- CFE and FIDE data
- Interviews with different teams of experts
- Simulations using a theoretical study of savings

Once all of the above have been conducted, the simulator of the Green Mortgage 2011 will be created. This is a tool that allows the eligible beneficiary to understand and become familiar with the eco-technologies in order to find the combination of eco-technologies that is best adapted to his needs and offers the most benefits in terms of his consumption of water, gas and electricity. Depending on which he chooses, the amount of savings will vary.



### Green Mortgages 2011 - Simulator

This tool will allow you to understand the minimum amount of monthly savings to be met, according to the payment capacity of the person requesting the loan, and choose eco-technologies. To do this, you must provide the following data:

Select either you are:	<input type="radio"/> Housing development <input type="radio"/> Infonavit beneficiary	
Housing prototype	<input type="text" value="-Seleccione-"/>	
State:	<input type="text" value="-Seleccione-"/>	
Municipality:	<input type="text" value="-Seleccione-"/>	
Bio climate Zone		
Monthly salary:	<input type="text"/>	
Age	<input type="text" value="-Seleccione-"/>	
Please write the following word as it appears	<input type="text" value="dn4mb"/>	<input type="text"/>
If you can not view the characters, try with another word		<input type="button" value="SEND"/>
Minimum monthly savings to be met:	<input type="text"/>	Minimum monthly savings to be met:

Source: INFONAVIT

---

## h) Incorporation of Eco-technologies in the HV

The evaluation that is conducted for the incorporation of products and systems in the HV considers the following:

- Energy savings
- Economic savings
- Improvement in quality of life
- Reduction in polluting emissions (CO<sub>2</sub>e)

The steps that INFONAVIT has followed for the incorporation of eco-technologies are:

### 1. References provided

- Relevant regulatory documents, such as Official Mexican Regulations, international regulations, construction regulations, and other particular specifications

### 2.- Application

- Clearly indicates the recommended use of the product/system in housing

### 3. Characteristics (description and physical tests)

- Characteristics of the product/system model in terms of: dimensions, impact resistance, resistance to variations in electricity, resistance to hydrostatic pressure, etc.
- Written technical specifications, complete drawings, photographs and catalog reference or number
- Definition of specifications to be met, endorsed by a Product Certification Agency, with the scope of the subject to be evaluated

### 4.- Tests and values obtained

- Evidence of results obtained, if tests have been conducted in laboratories
- Issuance of a certificate/opinion by the Product Certification Agency

### 5.- Recommendations and information by the provider of the product or system

- Recommendations on use, maintenance and installation
- Customer Service Centers – post-sale service
- Written guarantee
- Location of the provider

### 6.- Analysis of the following points:

- Requirements described in points 1 to 5
- Price
- Guarantees and useful life (for calculation of amortization)

- Reduction of CO<sub>2</sub>e emissions
- Amortization by type of new and used housing (economic, traditional and cofinancing)

INFONAVIT is supported by Federal Government agencies in charge of regulating energy and water issues: the Secretariat of Energy (Secretaría de Energía, SENER), the Commission for the Efficient Use of Energy (Comisión para el Uso Eficiente de la Energía, CONUEE), and the National Water Commission (Comisión Nacional del Agua, CONAGUA); as well as the National Housing Commission (Comisión Nacional de Vivienda, CONAVI) for the issues of housing and sustainability. The evaluation of products and systems is conducted with the endorsement and monitoring of Product Certification Agencies, which are in charge of issuing certificates for eco-technologies. The identification of expected and quantifiable benefits for eco-technologies, in which actions are analyzed and recommended under the "INFONAVIT-USAID Laboratory" program, enables INFONAVIT to make the decision to incorporate eco-technologies in the Green Mortgage simulator.

The products analyzed are published on INFONAVIT's Green Mortgage web page.

## i) Green Mortgage 2011 Objectives

1. **HV for all:** To bring the Green Mortgage's benefits to all those who are eligible.
2. **Flexible Green Mortgage:** Non-regulated package of eco-technologies, allowing beneficiaries to freely select them. Minimum objective of savings in family expenses, according to salary range and amount for HV related to savings generated by each salary range.
3. **Ongoing incorporation of new technologies,** taking into account those that support equipment durability and efficiency, and people's health.
4. **Raising international resources** to achieve a larger amount of sustainable housing through the incorporation of the Clean Development Mechanism (CDM) Program/Carbon Offsets.

## j) Results

The average proven savings from these eco-technologies, by house, in terms of family expenses were \$229.00 MXN (US\$20) per month, which were higher than the expected savings of \$215.00 MXN (approximately US\$18.7).

- 95% of eligible persons rated the Green Mortgage as good to very good.
- The credits issued were higher than the targets in the previous two years.
- Thanks to the Green Mortgage, awareness of sustainability has arisen among some housing developers that are committed to ensuring resources for future generations by incorporating eco-technologies in housing and in common areas of their housing developments. These eco-technologies in common areas include solar lamps, rain collection wells, double-drain pipes to separate water, treatment plants, etc.
- In those houses that have one or more eco-technologies as well as some of the eco-technologies in the Green Mortgage packages, INFONAVIT does not provide the additional



amount but recognizes them as ecological houses. Between 2009 and March 2011, **42,189 credits** for ecological houses were granted. These, added to the total amount of Green Mortgages, total **326,587 green housing credits**.

There have been excellent results not only in savings, but also in people's awareness of sustainability. An increasing number of developers view sustainability as an ally that not only contributes to the environment but also serves as a marketing opportunity to better sell their houses and seek better eco-technologies in order to implement them in their housing construction.

### k) International Recognition

INFONAVIT has been recognized by several countries as the first to begin to implement the concept of sustainability in housing for the low-income workers sector.

In September 2009 Mexico received the **"Star of Energy Efficiency" award from The Alliance to Save Energy** at an event held in Washington, DC. The Alliance is a nonprofit international organization that promotes energy efficiency throughout the world.

In addition, the German Federal Ministry of Environment **has allocated resources from the "International Environmental Protection Initiative,"** whose objective is to promote actions aimed at reducing greenhouse gas emissions in developing countries. These

resources have been allocated through the German Technical Cooperation Agency (GTZ), which signed a Collaboration Agreement with INFONAVIT in May 2010. **With the intermediation of GTZ, a total of €2.5 million have been granted, to be exercised between 2010 and 2012 under the Green Mortgage Program,** especially under the 25,000 Solar Roofs Program. Under this program, GTZ aims to promote water solar heating by providing part of the total purchase price of each heater.

**USAID**, an independent US federal agency that is responsible for administering and planning US economic and humanitarian foreign aid throughout the world, has supported the implementation of three testing laboratories in which housing eco-technologies are analyzed. The objective is to review the installation of eco-technologies in inhabited housing, not in houses under construction, as well as the beneficiaries' satisfaction, housing adaptation, durability, etc. USAID financed a video about Green Mortgages to promote this program.

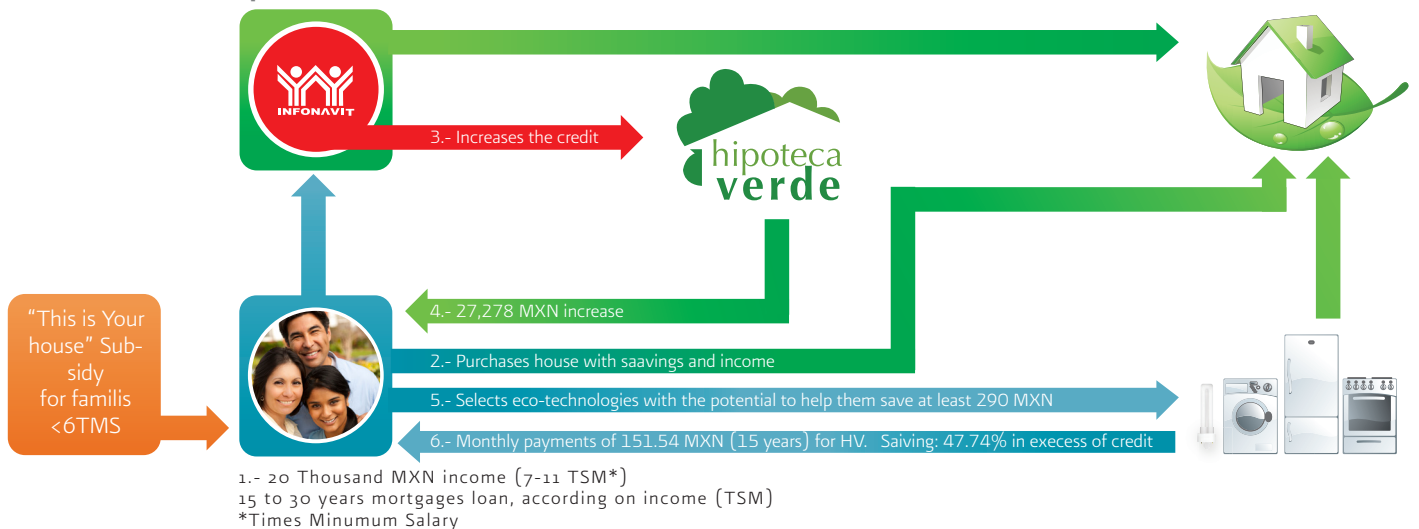
**The Inter-American Development Bank (IDB) recognized INFONAVIT's Green Mortgage with the "Beyond Banking 2010" Award in the Bank Planning category.** The objective of this award is to recognize the implementation of environmental and social sustainability and government incorporation in financial institutions in Latin American and the Caribbean.

*"Although discussion on the production of sustainable housing in other countries began at top of the income pyramid, in Mexico the opposite has occurred: it began with low-income housing, incorporating energy-saving*

### l) Chart for obtaining Green Mortgage (Hipoteca Verde, HV):



### m) HV Credit Example



technologies. This has not only had a positive impact on the environment, but it has also positively affected the economies of low-income families and has reduced the country's needs for water and energy investments and subsidies." Victor Borrás Setien, Director-General of INFONAVIT.

## 2. "This Is Your House" Subsidy 5

A subsidy operated by CONAVI to support the purchase or improvement of housing for those users with an income lower than 2.6 minimum salaries and who, without federal support, would not be able to purchase a home. The subsidy is added to the loan for which the worker is eligible and which is granted by housing finance institutions in Mexico (INFONAVIT, FOVISSSTE, SHF, etc.).

### a) Objectives

- To improve housing
- To promote its social production
- Self-production of housing
- Emergency situations caused by natural phenomena

### b) Characteristics of the Basic Package for the Subsidy

The granting of the subsidy is linked to a basic package of actions that must be fulfilled:

1. Site without risk and with good location
2. Efficient use of energy

- energy-saving lamps
- thermal isolation
- solar water heater

### 3. Efficient use of water

- water-saving accessories
- shower
- toilet
- meters

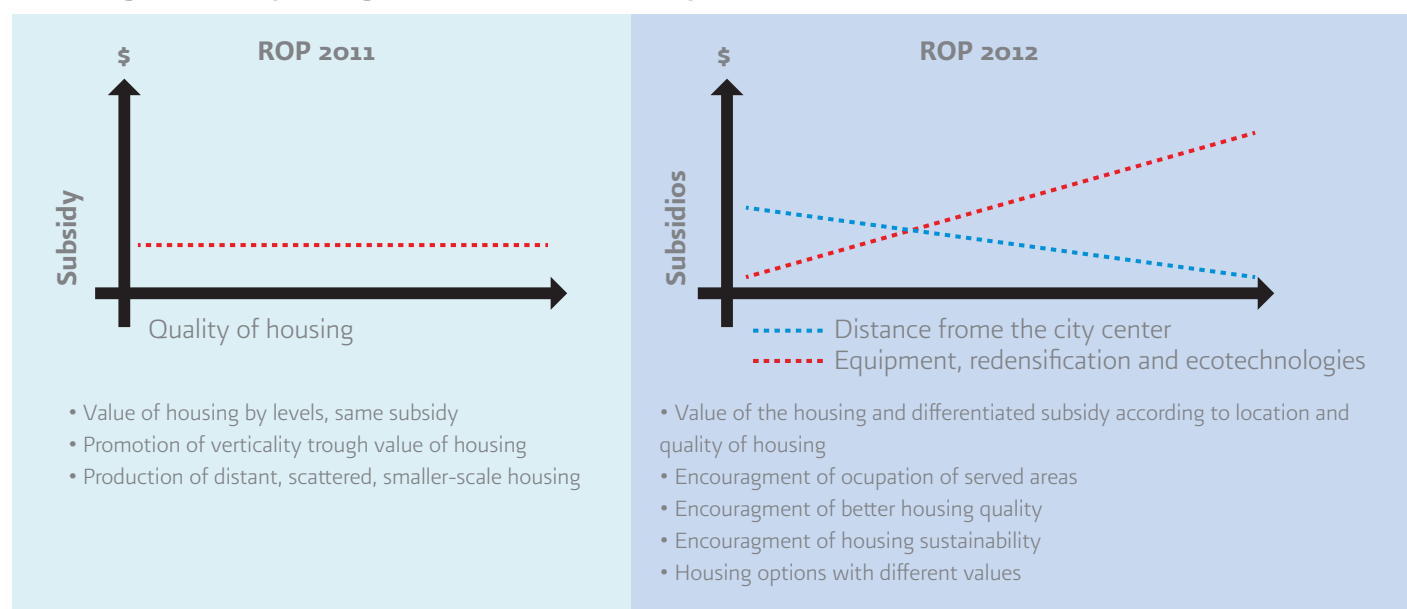
### 4. Management of urban solid waste

### 5. Maintenance

### c) CONAVI Requirements:

- Qualify positively in the CONAVI system
- Provide a savings of 9,092.64 MXN (5 VSMDVDF) (the amount that you have saved in your housing sub-account may be considered as part of this contribution)
- Not have received Federal Government aid for purchasing, building, expanding, repairing or improving a house
- The value of the house must be within the criteria established for it, according to type (horizontal or vertical), and whether the house is new or used. (Consult table showing amounts for the house value and subsidy)

## Advantages of the Operating Rules for Subsidies (comparison)



Source: Operation Rules for 2012 Subsidy. National Housing Commission

5 Based on information, documents and presentations provided by CONAVI. For more information, visit: [www.conavi.gob.mx](http://www.conavi.gob.mx).

## d) Notes

CONAVI reserves the right to grant the subsidy in accordance with the operating rules of the Program for Financial Schemes and Federal Subsidies for Housing published in the Official Gazette of the Federation on August 24, 2007 (the 2012 operation rules for the subsidy will be in force from 1st January 2012). For beneficiaries who are fully financed by INFONAVIT, the federal subsidy granted by CONAVI will be differentiated and the remaining amount will be applied to cover the value of the housing solution, once the prior savings, additional contributions and maximum credit capacity are achieved.

This is a public program; it is not sponsored or promoted by any political party and its resources come from taxpayers.

The outlook on subsidies is that they will gradually disappear, once the financial instruments are strengthened and the green mortgage is the only product offered as an alternative for purchasing a home in Mexico. Thus, the credit to which users will have access will be that offered by financial institutions, without the need for additional credit for the purchase of eco-technologies. Eventually, all workers will meet the necessary requirements to purchase a sustainable home without the need for federal support.

## 3. Sustainable Integrated Urban Developments (Desarrollos Urbanos Integrales Sustentables, DUIS)<sup>6</sup>

### a) Background

#### Stage I

The need to quickly provide housing to the population, the housing deficit, and a strongly consolidated mortgage system sparked a rapid growth in the sector, thus promoting large-scale housing development.

#### Stage II

The demand for housing had the following effects:

1. Land speculation and price increases
2. Uncontrolled growth of cities, because affordable land for housing was only found far from urban centers
3. High costs of transportation to job, health and educational centers for residents
4. High costs for municipalities and states to maintain new housing developments

#### Stage III

A public policy is created to promote Sustainable Integrated Urban Development under the following viewpoints:

1. Define the planned growth of cities
2. Use intra-urban land and promote verticality

3. Generate more housing with infrastructure, services and sufficient transportation, improving families' quality of life

### b) Federal Government Encouragement

The creation of a Group for the Promotion and Evaluation of Sustainable Integrated Urban Developments (Grupo de Promoción and Evaluación de Desarrollos Urbanos Integrales Sustentables, GPDUIS) was promoted, with the participation of the Secretariat of Finance and Public Credit, Secretariat of Social Development, Secretariat of Environment and Natural Resources, Secretariat of Energy, National Housing Commission, Institute of the National Housing Fund for Workers, Housing Fund of the Institute of Social Security and Services for Government Workers, National Bank for Public Works and Services S.N.C., National Infrastructure Fund, ProMéxico and Federal Mortgage Company.

**Five specific courses of action** that promote DUIS were consolidated in the past year.

#### c) Courses of Action

##### First Course of Action

##### Establish an Evaluation Methodology

1. Technical Evaluation: the criteria for evaluating the DUIS's technical component consider four areas: Regional, Urban, Neighborhood and Architectural, in terms of:

- Use of alternative energies, eco-technologies, bio-climate architecture, water management and re-use, solid waste management and use.
- Public spaces: More and better green areas, cultural, sports and recreational areas that promote neighborhood integration.
- Connectivity to services and sources of employment through light rail, metro, bikeways, and to the cities system.
- Sustainable transportation based on bikeways, light rail and pedestrian walkways.
- Consolidation of new development hubs with aptitude and facilities that promote sources of employment, commerce and services.
- Strengthening of the social fabric through the mix of predominantly vertical social, affordable, median and residential housing, close to services and sources of employment.

2. Evaluación Financiera: Diseño de productos de Financiamiento de DUIS apoyados por el Gobierno Federal, a través de la Banca de Desarrollo y CONAVI.

<sup>6</sup> Based on information, documents and presentations prepared by SHF. For more details, please see: [www.shf.gob.mx](http://www.shf.gob.mx)

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## **Second Course of Action**

### **Process of Automating and Transferring DUIS Knowledge**

The **second Course of Action** was to create an automated Internet-based evaluation process to assess potential DUIS projects and for their monitoring by federal, state and municipal governments and by the general public. In conjunction with UNAM and private universities, private courses for DUIS certification are being conducted for relevant actors.

Eighteen potential DUIS projects are being evaluated in 15 of the country's states, representing:

- 800,000 housing units
- 3,250,000 beneficiaries
- 20,500 hectares
- Investment of 275,000 million MXN

### **Third Course of Action** **Redensification**

The third Course of Action is aimed at redensification projects. In GPDUIS, the most intelligent use of land is considered to be intra-urban, and urban regeneration has therefore been promoted with local governments through programs to rescue areas that, due to the passage of time and changes in land use, have become immersed in the city, with sufficient but underused infrastructure and services.

- Examples include:
  1. Rehabilitation of Puebla's historic center
  2. Mérida revitalization project

### **Fourth Course of Action** **DUIS aptitude and equipment**

Each DUIS has predominant productive activities that will invigorate the economic development of a certain region, thus becoming the driver not only of housing but of services, infrastructure and recreation in benefit of the community residing in the zone.

The aptitude of the DUIS should generate competitiveness and sources of employment at regional and urban levels.

For the purpose of identifying this aptitude, a pilot program is being carried out in approved DUISs, establishing study parameters related to natural, population, productive, economic, environmental and regulatory resources, which will be included in the RUBA Methodology.

In addition, once the aptitude is identified, a determination is made of the public-private facilities that should be developed, compatible with the aptitude in the DUIS:

- Public transportation
- 

- Education, culture, health and social assistance

- Industry, commerce and supply

- Public administration offices

- Recreation and sports, under the regulatory framework established for this subject.

### **Fifth Course of Action** **Institutionalization**

The group's **fifth Course of Action** is the institutionalization of the GPDUIS, with the objective of ensuring its long-term governance.

The institutionalization will aim to standardize the apportionment of the Federation's Portfolio of Incentives, and make it flow toward projects once they have been certified as DUISs. In turn, a series of penalties and sanctions will be established for noncompliance of commitments by any of the parties involved.

As part of this process, a DUIS website is being developed so that inhabitants of each DUIS and the general public can follow its evolution and development, which will be updated by the project sponsor.

This institutionalization will consider a transition plan so that the DUIS model can become the national standard.

### **d) Institutionalization: Inter-Secretarial Housing Commission**

The Inter-Secretarial Housing Commission (the Commission) is an agency envisaged in the Housing Law. Its objective is to ensure program execution and promote housing efforts so that these can be conducted in a coordinated manner. It is presided by the President of the Republic or by the person appointed by him, and has an Executive Secretary who is the head of CONAVI.

The Commission's agreements are mandatory for its member agencies.

Some of the Commission's duties are to:

- Coordinate efforts to promote economic growth, social development, urban development, land planning, environmental improvement, etc.
- Reach agreements on investments and on financial and coordination mechanisms to expand the availability of housing; facilitate credit to the entire population; consolidate the social production of housing; achieve greater transparency and fairness in the allocation of federal support, stimulates and subsidies for the purchase, construction and improvement of housing; understand the implementation of intersectoral actions and investments for the achievement of decent housing and, if necessary, formulate the corresponding proposals.

The Law indicates that other agencies and entities of the Federal Public Administration may be invited to participate in the Commission's sessions, depending on the subjects to be addressed. It is not required that all members of the Commission participate in working groups or sub-commissions.

### e) Integrated Sustainable Urban Developments

Comprehensively planned **development areas** are those that contribute to the land-use planning of states and municipalities and promote more orderly, fair and sustainable urban development.

**Driver of regional development**, in which housing, infrastructure, services, facilities, commerce, education, health, industry, recreation and other inputs constitute support for regional development.

**Mixed projects**, in which federal, state and municipal governments participate, as well as developers and landowners, that can be integrated in urban development.

The concept of sustainable housing is addressed in a broader context that compasses the neighborhood, the city and the region, taking the following aspects into consideration:

- An efficient, sustainable urban infrastructure
- The integration of industry and commerce to allow employment creation in the region Strategies to facilitate mobility and accessibility
- The provision of services: education, health, social activities
- Territorial coordination
- Environmental protection and rational use of natural resources

### f) Types of DUIS

The housing development sectors that may potentially be addressed by DUIS are:

1. Projects for the use of intra-urban land through the intelligent re-densification of cities, focusing on medium- and small-scale developers, municipal and state governments.
2. Projects to generate serviced land with infrastructure, developers of macro-lots, creating new development hubs under the New Cities and Communities scheme, in which real-estate developers, state and municipal governments can participate.

### g) Sponsors of DUIS

In general, there are three types of potential sponsors for DUIS:

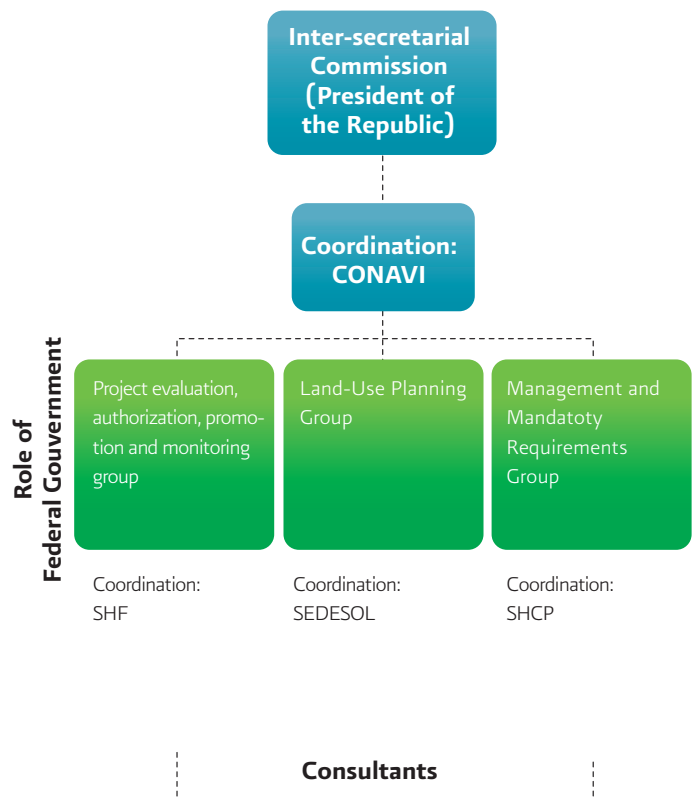
**1. State Governors:** Planning and land-use planning of human settlements, coordinating the private and social sectors.

**2. Urban Developers: Development of land suitable for urban use,** offering spaces that can host the services and facilities the city requires, under an orderly scheme that is in line with the state and municipal planning strategy.

**3. Housing Developers:** Offering housing with legal security, infrastructure, services and equipment.

### h) Integration and Coordination Scheme for the Institutionalization of GPDUIS

Agreement has been reached with all GPDUIS members to form three working groups for the implementation of the specific strategies, which will be assigned to each of the groups in light of the role that the Federal Government would play in the projects.



## i) Institutionalization at Civil Society Level: DUIS Consultative Committee

The maturation period of certified DUISs requires adequate governance instruments that ensure the coordination and proper distribution of duties and responsibilities among the actors involved.

A comprehensive set of **incentives and sanctions** is being developed, focusing on the efficiency, effectiveness and distribution of incentives, including possible sanctions, with the objective of ensuring that the commitments established in certified DUISs are fulfilled.

In turn, it is relevant that the project be institutionalized at civil society level, who will live in Mexico's new cities, through a **Consultative Committee composed of leaders of society**, so that compliance with the minimum standards established by the DUISs can be promoted over time, and their mandatory compliance in the short term can be promoted.

The above will be highly relevant, because the Population Bonus existing in Mexico is calculated so that in the next 30 years approximately 35% more homes than those currently existing in Mexico will be produced, and thus it will be vital to improve their environment and quality.

## j) Projects – Current Status

To date, there are **five\*** DUISs certified by GPDUIS. These represent:

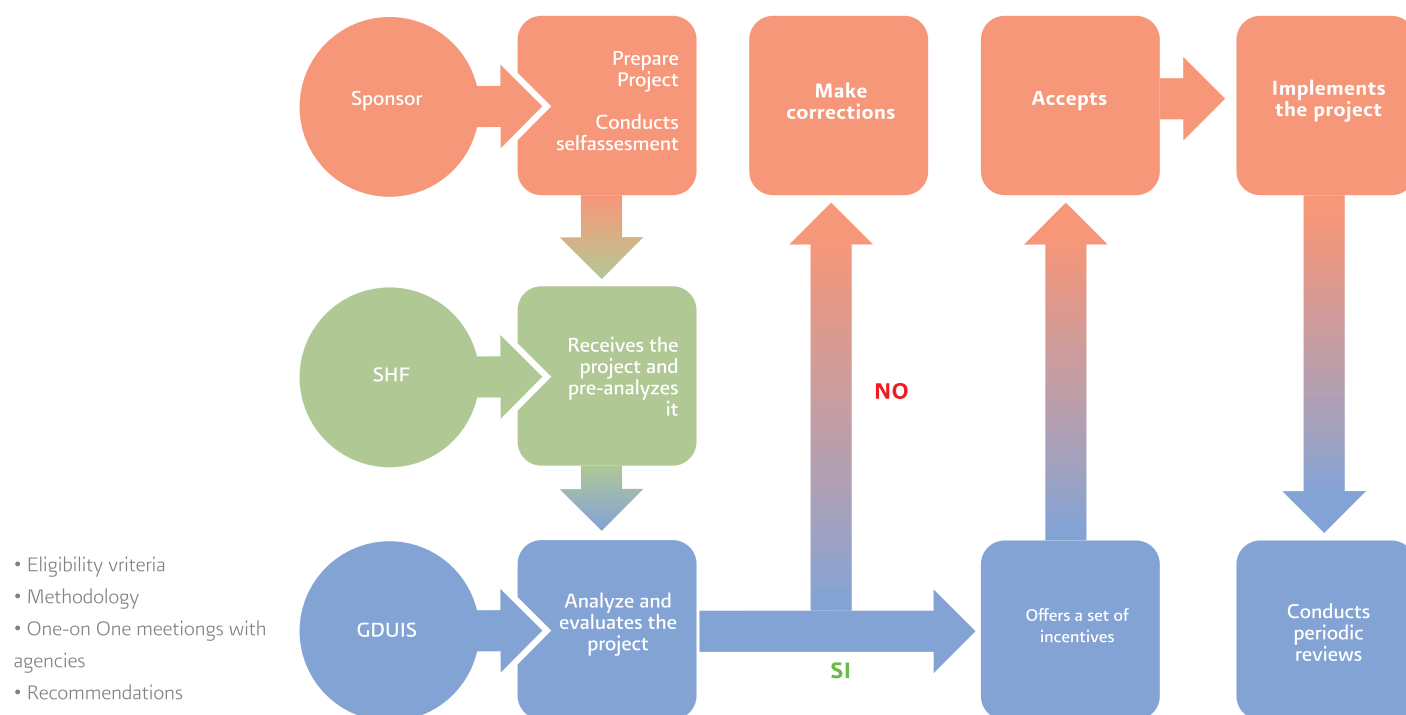
- approximately **254,500** houses
- **1,020,500** beneficiaries
- **7,470** hectares
- an estimated investment of **54,000 million MXN**

SHF and IDB supported the preparation of the Partial Plan for Urban Development, with DUIS criteria, for states. These include:

- Ciudad Nah-Uj in the municipalities of Ucú and Mérida, Yucatán: a 3,000 hectare project for 35,000 houses, highlighting respect for the environment and archeological ruins in the zone.
- Ciudad Vive: 1,000 hectares for 27,000 houses in Tlajomulco, a municipality close to the Metropolis of Guadalajara.

Moreover, SHF is working with the Governors of **Campeche, Guanajuato, Puebla, Durango, Oaxaca and Aguascalientes** to determine where their DUISs will be situated.

## k) DUIS Operative Scheme



## 4. Challenges of Sustainable Housing in Mexico

In addition to the previously mentioned challenges such as planning (land use, services, etc.) which are essential for housing developments, there are other considerations that must be overcome in order to achieve compliance with the objectives and interests of the public policy on housing and promoting its sustainable housing model.

Financial institutions must be willing to replicate the HV model within their institutions.

- State and municipal authorities should review, modify and implement construction regulations and grant permits that are in line with stipulations by federal authorities on this subject.
- Housing developers should be convinced of the advantages that the planning and design of sustainable developments have for them.
- Users and society as a whole should be convinced that sustainable housing is a good alternative at the time of purchasing a home, that the additional costs of such a home are worthwhile, in consideration of contributions to the environment and to household savings.

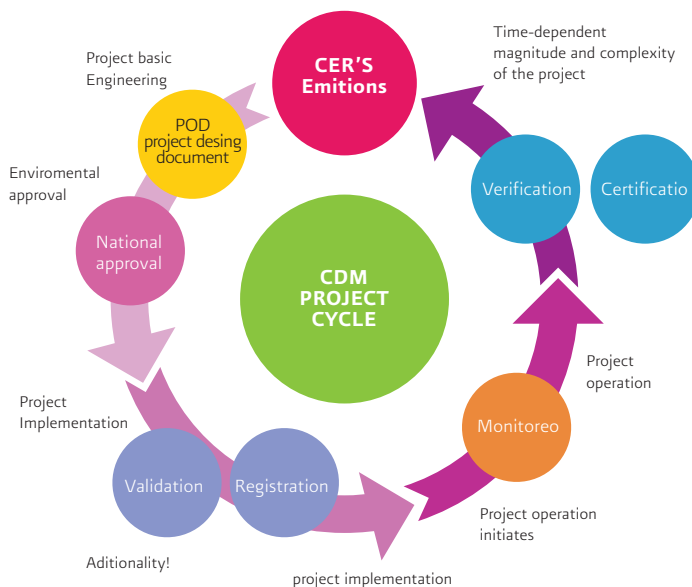
## VI. INITIATIVES TO STRENGTHEN SUSTAINABLE HOUSING IN MEXICO

### 1. Seeking Climate Finance for Scaling Up

In support of the efforts and commitments assumed by the Federal Government, mechanisms of collaboration with international cooperation agencies, namely the German Federal Environmental Ministry (BMU) through the German Agency for International Cooperation (GIZ, as per its acronym in German) and the World Bank, have been generated to streamline the execution of sustainable projects throughout the country.

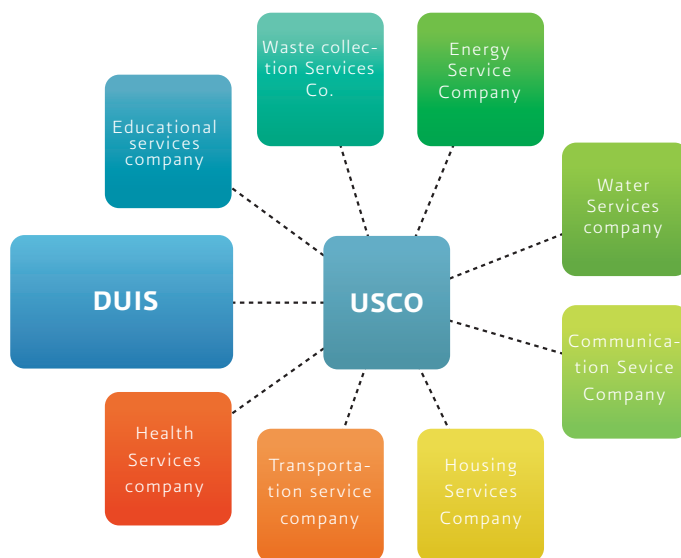
The initiatives have basically been focused on the design, establishment and implementation of mechanisms stemming from relevant international agreements on climate change. The mechanisms that are planned to be promoted are: Clean Development Mechanism, Nationally Appropriate Mitigation Actions (NAMAs) for housing and urban development.

The design of these mechanisms has already begun. One example is the Clean Development Mechanism (CDM) Program of Activities (PoA) for Sustainable Housing, which is currently being modified to reflect the evolution in scale and technologies of the HV. To develop it, a program was designed to generate carbon offsets; it is divided in two stages: the Program of Activities I (PoA I), which considered housing constructed under CONAVI's Green Subsidies program "This Is Your House," and the Program of Activities II (PoA II) opportunities for adding more carbon credits to the initiative, such as the Green Mortgage.



This strategy for sustainability in the housing sector is reinforced by the supported Housing NAMA. This NAMA is a mechanism that seeks to obtain green financing from Annex 1 countries and establish environmental protection actions and measures. Its aim is to expand the coverage of housing that is currently addressed, bringing the sustainable housing model to other financial institutions that deal with social housing in Mexico (FOVISSSTE, SHF), as well as upscaling considerations for the current sustainable housing model by designing a Mexican version of the "Whole Housing Approach." Through these efforts, low-income families can have access to state-of-the-art technologies for housing, which will have a greater impact on the reduction of GHG emissions and thus on the carbon footprint of the housing sector in Mexico.

In addition, an urban NAMA will be developed to enable the promotion of sustainable urban development. Under this mechanism, experiments will be conducted on innovative concepts, such as Urban Service Companies (USCOs), which are derived from the innovative model of Energy Service Companies (ESCOs).



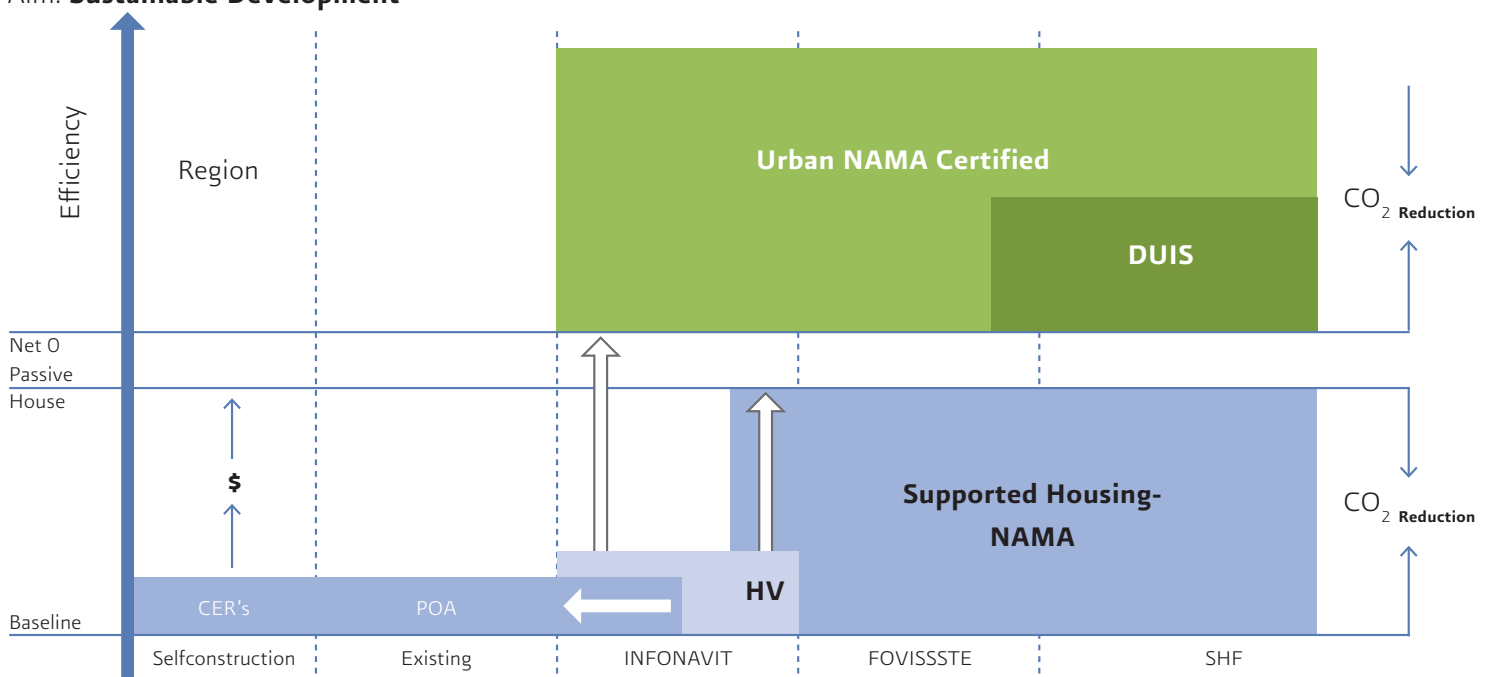


USCOs are expected to be urban and infrastructure service providers (energy, water, sewage, etc) for cities. With these companies, the aim is to guarantee service delivery at prices that are independent from the price variations of conventional energy prices, because they use renewable energies to offer their services. It is estimated that this type of companies and mechanisms will enable more efficient management of urban zones.

Finally, the housing policy will be reinforced by national civilian associations, such as the recently formed “Sustainable Housing and Environment” PPP (Public Private Partnership), through which housing developers, government and academia will share responsibility for the proper management of land and resources with sustainable sectoral initiatives.

Under an optimistic scenario, it is expected that the initiatives will comply with processes of submission and approval by international authorities established for these purposes. The efforts of international cooperation agencies and the teams of consultants that they hire to contribute to the design and implementation of the initiatives will be in terms of the expectations proposed by the housing sector in Mexico through the head of this sector, CONAVI, without losing sight of the fact that this implementation does not guarantee project approvals and accreditations.

Aim: **Sustainable Development**



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## 2. PPP for Sustainable Housing and Environment <sup>7</sup>

With the formation of the sustainable housing and environment association (*Asociación Público-Privada "Vivienda y Entorno Sustentable"*), the aim is to achieve a unified response by the housing sector to the challenges of climate change. Work is conducted under the framework of an inclusive group that shares a common vision in order to make appropriate decisions and address the environmental, economic and social dimensions of sustainability in housing policy, for the benefit of the population living in a housing development.

The role of the PPP as a contribution to sustainable initiatives in the sector is to generate and validate the baselines which will be considered as a starting point for the implementation of projects and the quantification of avoided emissions.

The progress of the initiatives will be analyzed by the Partnership for verification and validation, taking advantage of the leadership of its President, Dr. Mario Molina, on the issue of climate change mitigation.

### a) Mission

To provide a sustainable quality of life in economic, environmental and social hubs through urban housing developments that ensure resources for future generations.

### b) Vision

To cause the housing sector to become a leader and facilitator in generating quality of life in the three dimensions of sustainability.

### c) Who form the Association?

CONAVI, SHF, INFONAVIT, FOVISSSTE, GEO, URBI, SADASI, ARA and VINTE (housing developers in Mexico), led by Dr. Mario Molina and his team, as experts in the subject of climate change.

### d) Key Actions

1. Make an additional effort to address and overcome the challenge of global warming and take urgent actions to mitigate and adapt to climate change.
2. Define a new approach in sector policy under this new economic, social and urban context.
3. Give a new turn to housing policy by including strategies to integrate urban, economic and regional development and planning with housing and land policies, and create sustainable communities that integrate housing in an environment that allows the healthy development of the population, with better living standards and in cities that are more competitive and have educational, health and recreational services.
4. Conduct projects and activities that consolidate the viewpoint of sustainable (economic, social and environmental) policy, the coordinated

participation of the government sector, housing finance agencies, and executors of housing developments, promoting activities to improve housing policy instruments and seeking new alternatives to address the challenges in housing construction.

5. Use the process of housing construction and technological modernization not only as a key element of economic growth but also as an instrument to achieve sustainability through the use of new technologies and products that decrease the cost of housing, make more efficient use of resources, and decrease the impact on the environment.

6. Try to make environmental protection compatible with housing development strategies, calculate the carbon footprint of the housing sector, and establish annual mitigation goals until 2030 through a higher level of energy efficiency and a major change toward low-carbon energy sources.

7. Encourage consumers to use lower-carbon appliances and equipment.

8. Develop suitable incentives to implement strategies, and seek international cooperation mechanisms to ensure their viability.

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<sup>7</sup> With information provided by the PPP for Sustainable Housing and Environment (*Asociación en Pro de la Vivienda y el Entorno Sustentable*).

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## VIII. GLOSSARY

### 1. Terms

**CO<sub>2</sub>e.**- Carbon dioxide equivalent

**Development Bank:** One that finances, normally at a lower-than-market rate, projects whose purpose is to promote the economic development of a certain region or group of countries

**Derechohabientes (Beneficiaries):** The direct, legal beneficiaries of an insurance system granted by employers to workers. This is associated with social security, housing and the retirement fund.

**DSV:** Desarrolladores Sociales de Housing (Social Developers of Housing)

**Eco-technologies:** Technological tools that offer environmental advantages (energy efficiency, sustainable use of resources) over their traditional counterparts

**ESCO:** Energy Service Company

**DUIS:** Desarrollos Urbanos Integrales Sustentables (Sustainable Integrated Urban Developments)

**Ésta es tu Casa (This is Your House):** Federal subsidy for the housing sector

**GEF:** Global Environment Fund

**HV:** Hipoteca Verde (Green Mortgage)

**HVF:** Hipoteca Verde Flexible (Flexible Green Mortgage)

**LCUD:** Low Carbon Emissions in Urban Development Program

**MDL (CDM):** Mecanismo de Desarrollo Limpio (Clean Development Mechanism)

**MXN:** Currency of Mexico. As of October 24, 2011, the peso's exchange rate was 13.54 per U.S. dollar.

**NAMA:** Nationally Appropriate Mitigation Actions

**PND:** Plan Nacional de Desarrollo (National Development Plan) 2007–2012

**PNV:** Programa Nacional de Vivienda (National Housing Program) 2008–2012

**PoA:** Program of Activities

**PSV:** Producción Social de Vivienda (Social Production of Housing)

**RUV:** Registro Unico de Vivienda (Unified Housing Registry)

**Subsidios Verdes (Green Subsidies):** Subsidies (government support) to support and promote sustainable actions

**UNDP:** United Nations Development Programme

**USCO:** Urban Service Companies

**VS:** Vivienda sustentable (Sustainable housing)

**VSMDVDF:** Veces salario mínimo diario vigente en el Distrito Federal (Times current minimum wage in the Federal District)

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## 2. Instituciones

**ARA:** Desarrolladora de Vivienda Mexicana (Mexican Housing Development Company)

**Asociación de Vivienda and Entorno Sustentable:** Sustainable Housing and Environment Association, a multisectoral association

**BANOBRAS:** Banco Nacional de Obras and Servicios Públicos S.N.C. (National Bank for Public Works and Services)

**CNV:** Consejo Nacional de Vivienda (National Housing Council)

**CSV:** Comisión Intersecretarial de Vivienda (Intersectoral Housing Commission)

**CONAVI:** Comisión Nacional de Vivienda (National Housing Commission)

**CONOREVI:** Consejo Nacional de Organismos Estatales de Vivienda, A.C. (National Council of State Housing Agencies)

**ENERVALIA:** Spanish company that provides energy consulting services

**FONADIN:** Fondo Nacional de Infraestructura (National Infrastructure Fund)

**FOVISSSTE:** Fondo de la Vivienda del Instituto de Seguridad and Servicios Sociales de los Trabajadores del Estado (Housing Fund of the Institute of Social Security and Services for Government Workers)

**GEO:** Desarrolladora de Vivienda Mexicana (Mexican Housing Development Company)

**GPDUIS:** Grupo de Promoción and Evaluación de Desarrollos Urbanos Integrales Sustentables (Integrated Sustainable Urban Development Promotion and Evaluation Group)

**INFONAVIT:** Instituto del Fondo Nacional de la Vivienda para los Trabajadores (Institute of the National Housing Fund for Workers)

**ProMéxico:** Mexican Federal Government agency in charge of strengthening Mexico's participation in the international economy

**SADASI:** Desarrolladora de Vivienda Mexicana (Mexican Housing Development Company)

**SE:** Secretaría de Economía (Secretariat of Economy)

**SEDESOL:** Secretaría de Desarrollo Social (Secretariat of Social Development)

**SEMARNAT:** Secretaría de Medio Ambiente and Recursos Naturales (Secretariat of Environment and Natural Resources)

**SENER:** Secretaría de Energía (Secretariat of Energy)

**SHCP:** Secretaría de Hacienda and Crédito Público (Secretariat of Finance and Public Credit)

**SHF:** Sociedad Hipotecaria Federal (Federal Mortgage Company)

**UNAM:** Universidad Nacional Autónoma de Mexico (National Autonomous University of Mexico) URBI: Desarrolladora de Vivienda Mexicana (Mexican Housing Development Company)

**VINTE:** Desarrolladora de Vivienda Mexicana (Mexican Housing Development Company)

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