

City Completion Report: Porto Alegre, Brazil

Local Renewables Model Community Network

July 2010



gtz

The BMZ commissions the GTZ to work worldwide to encourage sustainable development and international cooperation.

The Local Renewables project: a set of final reports

The **Local Renewables Model Communities Network** (Local Renewables project) was implemented by the ICLEI South Asia Secretariat in India, the ICLEI Latin America and Caribbean Secretariat in Brazil, the ICLEI European Secretariat for working with European cities and ICLEI's International Training Centre as global project manager.

This report is one element of a set of reports compiled after five years of working at the local and global levels. References to other reports and available case studies are made as well.

India

Bhubaneswar City Completion Report

- Case Study # 108: Pioneering RE and EE application in India's municipal health sector
- Case Study #109: Installation of energy efficient lighting at the Lord Lingaraj Temple

Nagpur City Completion Report

- Case Study # 110: Water sector audit enables efficient use of water and energy resources in Nagpur

Coimbatore City Completion Report

- Case Study # 111: Reducing carbon emissions while improving Coimbatore's municipal public services

Country Completion Report for India

Brazil

Betim City Completion Report

- Case Study # 112: Solar heaters in low income housing: Energy and financial savings
- Case Study # 115 (Portuguese): Cemig leva Energia Elétrica elétrica chega à a comunidade de baixa renda com apoio do CRER Betim

Porto Alegre City Completion Report

- Case Study # 114 (Portuguese): Energia Solar é Incentivada em Lei sobre Compensação Vegetal em Porto Alegre

Country Completion Report for Brazil

- Case Study # 113: Stakeholder involvement groups for Local Renewables in Betim and Porto Alegre

Global

Global Completion Report including information on the European Resource Cities

- Case Study #104: Freiburg, Germany: Long-term strategies for climate protection in Green City Freiburg
- Case Study # 116: Växjö, Sweden: Becoming Fossil Fuel Free with citizen and stakeholder involvement
- Case Study # 117: Milan, Italy: Improving the district heating system with RE and EE

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What we have achieved

May 2004: National governments from all over the world met at the International Conference for Renewable Energies Bonn 2004 to discuss how they could work together to promote renewable energy on the global energy agenda. ICLEI organised the local government input to this international conference, boosting local governments as strong allies in the process. Where Agenda 21 was translated into Local Agenda 21 and became a prominent world-wide approach, ICLEI's intention was to similarly develop **Local Renewables** as an implementation concept.

More than just a term, Local Renewables (LR) today is the vision of many cities and towns around the world - of strengthening and unifying their efforts, thereby creating a tangible contribution to the proliferation of renewable energy.

The roles, responsibilities, planning activities, implementation of actions, and even investments of local governments are extensive, and highly relevant to the generation and use of energy. The ambition of many cities and towns to move to clean, sustainable energy solutions is motivated by many different issues: sufficient and affordable energy for all, climate protection, climate change adaptation, local economic development, etc.

**Local Renewables =
renewable energy (RE) +
energy efficiency (EE) +
energy savings
on the local level**

ICLEI's definition of
"Local Renewables" in short

A growing group of local governments have set **targets** and outlined roadmaps to achieve improvements – from very specific targets for a specific sector e.g. achieving 100% renewables for government operations by 2012 (Yarra, Australia), to highly ambitious targets for the whole community such as becoming a 100% fossil fuel free community by 2050 (Stockholm and Växjö, Sweden) or a CO₂ neutral city by 2025 (Copenhagen, Denmark). More typical approaches are incremental increases of renewable energy e.g. switching 4% of total energy consumption in the community to RE by 2010 (Beijing, China) or 10% by 2013 (Bilaspur, India).

Through the ICLEI Local Renewables Initiative, the intention is to strengthen, guide and support those local governments around the world which want to become leaders in the field, acting as model communities or beacons for their peers. We are proud that many ICLEI members are among the most advanced cities in the field of RE and EE, also that in many countries the collaborative work in ICLEI-led projects provides the impetus to unfold their potentials.

RE used to be considered a solution for rural energy challenges, or a hobby theme of the rich, high-tech focused Western world. Since the 2004 conference however, it has increasingly been seen as a viable energy solution for a wider spectrum of the global community, and an area for important investment in cities. Our ambition is to demonstrate and prove that Local Renewables not only make a great deal of sense in urban areas in both the Global South and Global North, but are key and vital for economic and sustainable development for all.

We sincerely thank the **German Federal Ministry for Economic Cooperation and Development (BMZ)**, (especially its representative Mr. Manfred Konukiewitz) which took up our proposal to support cities in developing countries as an official conference pledge for a project on "Local Renewables" at the Renewables 2004 Conference.

Thanks to the generous financial support by the BMZ and the helpful and motivating guidance of the **GTZ** as the managing agency for the Ministry, India and Brazil were selected as countries to launch a multi-year project designed to develop and support model communities. Special thanks are expressed to Dirk Aßmann and Marian Rzepka from the GTZ headquarters who have helped to develop and shape this project into a unique, high-impact action, representing a new approach

for German development cooperation and who gave us continuous support throughout the project.

Between November 2005 and June 2010, the city governments of Nagpur, Bhubaneswar and Coimbatore (India), as well as Betim and Porto Alegre (Brazil), were respectively supported by the ICLEI South Asia Secretariat in Delhi and the ICLEI Latin America and Caribbean Secretariat in Sao Paulo – assisting the audit of their energy needs, developing a LR strategy and policy, setting up action plans and starting to implement projects. These cities are all models for many more communities and are in contact with networks of satellite (observer) cities in the two countries. All **model communities** have opened Resource Centers for RE and EE and started to involve stakeholders in their activities, from the planning phase onwards.

In parallel, the European Resource Cities, including Malmö and Växjö (Sweden), Bonn and Freiburg (Germany) and Milan (Italy), supported the learning communities under guidance of the ICLEI European Secretariat in Freiburg. They offered advice, motivated change, provided relevant examples of policy and technology approaches, and shared reference projects with the Indian and Brazilian model communities.

With the project coming to an end, we leave a **multi-faceted legacy**: from baseline energy inventories, to new directions for energy policies developed by councils, energy teams in local administrations, stakeholder groups who meet regularly, and technology applications such as solar thermal systems providing stable hot water in hospitals. Local business see markets developing and citizens are learning about sustainable energy options for their daily lives, also recognizing that their councils are addressing stable, affordable and clean energy in the community.

We also leave useful case studies to guide other cities and towns plus city and country completion reports that document what can be achieved through such a project, a global completion report that records lessons learned and experiences made, as well as a public report to encourage many more to follow the examples of the LR model and resource communities.

A **network** of committed cities has been established, communities which have experienced – despite language barriers and travel challenges – that they all head towards a sustainable energy future, only made possible with a strong contribution from the local level.

There is also a legacy at the global level: We have established cooperation and networks between cities, and have improved the understanding among national and regional government representatives that strengthening the local level is a success factor for reaching their own goals¹.

ICLEI's involvement in the UN **climate negotiations** has helped to include LR in the global advocacy efforts and addresses governments on all continents. The cooperation with REN21 has led to the development of a **web portal** on Local Renewables (www.local-renewables.org), our "**Local Renewables Conference**" series in Freiburg and other cities brings interested and motivated city representatives together, and our regular contributions

¹ Within the project "Local Renewables Model Communities Network" the success is measured with 4 indicators, which had been developed at the project start in 2005. Therefore references to them are made in the text.

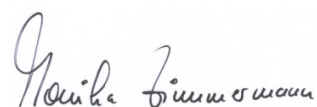
to the **Global Status Report on Local Renewable Energy Policies** have demonstrated that Local Renewables go from pioneering to mainstreaming.

We are pleased that many leaders who strive for a low carbon economy have understood the “local” message, and have intensified work between different levels of governments. Slowly but steadily, LR on the local level is becoming a theme of growing importance also for science, business and the media.

As project managers over a four and half year period, our sincere appreciation is extended to the local leaders and on-site implementers in the model communities, satellite cities and resource cities – people who share this vision and have contributed to make it a reality. Gratitude is also given to many colleagues in the various ICLEI offices² who have been helping cities and towns to establish “Local Renewables” policies and processes, and who have developed a set of very convincing arguments on the need for LR.

ICLEI is committed to continue and increase its efforts to promote Local Renewables, in particular through extending the “model cities in a model country” approach to more regions.

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³ Due to internal reorganization, the International Training Center, which had been the project manager for the last years, is transformed to the new ICLEI Capacity Center which keeps responsibility for the Local Renewables Initiative.

List of abbreviations

| | |
|--------|---|
| CCP | Cities for Climate Protection Campaign |
| CEEE | State Company of Electric Energy (<i>Companhia Estadual de Energia Elétrica</i>) |
| CEPD | Master Plan Executive Commission (Comissão Executiva do Plano Diretor in Portuguese) |
| CIGE | Internal Commission on Energy Management (Comissão Interna de Gestão Energética) |
| CREA | Regional Council of Engineers, Architects and Agronomists |
| CRER | Centro de Referência em Energias Renováveis e Eficiência Energética |
| EE | energy efficiency |
| FIEMG | Federation of Industries and Businesses of Minas Gerais |
| GHG | greenhouse gas |
| ICMS | circulation of goods and services tax |
| MCMV | Minha Casa Minha Vida |
| NAT | Friends of the Earth Brazil Nucleus (<i>Núcleo Amigos da Terra Brasil</i>) |
| PUC-MG | Pontifícia Catholic University of Minas Gerais |
| RE | renewable energy |
| REEERC | Renewable Energy and Energy Efficiency Reference Center, also known as CRER |
| SMAM | Porto Alegre's Municipal Environmental Secretariat (<i>Secretaria Municipal de Meio Ambiente</i>) |
| SWH | solar water heater |

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1 Summary:

The Local Renewables project in Porto Alegre

Local governments play a key role in promoting sustainable energy at the community level. They have a political mandate to govern and guide their communities, provide services and manage municipal assets. They have legislative and purchasing power that they can use to implement change in their own operations and in the wider community. Local governments can further play a role as a model in their region or country, showing how policies and local actions can be shaped to guide communities in the transition to a sustainable energy future.

The Local Renewables Model Communities Network (Local Renewables project) supports and strengthens local governments in their renewable energy and energy efficiency policies in the urban environment. The focus is on the roles and responsibilities of local governments as the driving force for innovation and investment in their communities. Thus, the project contributes to ICLEI's global Local Renewables Initiative.

The selected communities in the Network benefit from the expertise of other local administrations that are advanced in their sustainable energy strategy by encouraging and shifting towards the generation, distribution, and use of renewable energy. Model communities show regional leadership by encouraging other cities to switch to local renewables by sharing their experiences and expertise. In India and Brazil selected model cities receive special support.

Porto Alegre was selected as second model community in Brazil in 2008. Since then Porto Alegre has worked on LR policies, has set-up a LR Resource Center (CRER) and has started a variety of activities.

Energy policy: The Municipal Environmental Secretariat of Porto Alegre via CRER opted for a long term strategy, building internal capacity on legislative processes, creating and strengthening bonds with important partners and uncovering and understanding existing legislation before establishing new and more comprehensive ones. As a result, existing legislation in favour of RE and EE is checked and respective enforcement prepared. Local laws on solar energy in buildings and the installation of SWH are on top of the priorities.

A **LR Resource Center** (CRER) was opened in 2009 and is now operating with three to four (part-time) staff. CRER is managing the stakeholder involvement in Porto Alegre as well as the contacts to other units within the administration to foster RE and EE.

Proposals of CRER are being implemented along an action plan which includes strategic activities in the context of the national program "Minha Casa Minha Vida" and short term activities, e.g. in the field of energy audits of buildings.

2 Basic Information on Porto Alegre

2.1 Porto Alegre in brief

Porto Alegre was elected in 1996, 1998 and 2002 as the metropolis with the best quality of life in Brazil by the United Nations. The capital of the southern most state of the Country – Rio Grande do Sul, Porto Alegre is considered to be among the greenest cities in the world, with over 1.2 million trees. The City has over 580 squares, a biological reserve, nine urban parks and two conservation units. It is an important business center for the southern part of the continent – the Southern Cone due to its proximity to the countries of Uruguay and Argentina that participate in the region’s commercial bloc, Mercosul. Its unique culture that romanticizes cowboys and is enriched by a mixture of German and Italian descendents attracts many tourists that skip the Country’s famous beaches to enjoy its colder temperatures in the winter months.



Picture 2.1: Air View of Porto Alegre

Porto Alegre – an ICLEI member since 1997 was the first city in Brazil to have a Municipal Secretariat of Environment, founded in 1976, and, since then, has been implementing innovative environmental projects. The City’s research and technical capabilities are enriched by the institutions of higher education in Porto Alegre that also attract academics and students. As a result many fruitful partnerships with the City have been formed, including in the field of renewables as we will discuss later.

| | |
|------------------------------|---|
| Population: | 1.436.123 |
| Area of municipality: | 470,25 sq km |
| Annual budget: | R\$ 2,820 billion (2008), equivalent to € 1,300 billion |

2.2 Porto Alegre’s role in the project

The Capital of the *Gaúchos*¹ was one of the first cities to join ICLEI’s international Cities for Climate Protection (CCP) campaign in January 2002.

Porto Alegre applied to be the Network’s first Brazilian Model Community in 2005, wanting to expand its activities and know-how of sustainable energy. But it was not until 2008 that the

¹ Gaúchos is the name given to the inhabitants of the State of Rio Grande do Sul which is similar in meaning to cowboys.

city was selected to be a Model Network. Porto Alegre's commitment to sustainability could also be seen through its participation in other projects.



Picture 2.2: Gaúcho drinking a typical beverage from the region, chimarrão

The City has also been active in the renewable energy field, having been awarded a national prize in 2009 on the use of recycled vegetable oil to fuel city-owned vehicles. Given that the transportation sector in Porto Alegre emits 68% of its GHG, it is clear why Porto Alegre has developed projects that focus on alternative fuel sources for motorized transportation. In addition it is one of the first cities to promote the use of solar energy by legal instruments. We will discuss these initiatives in greater lengths in sections 5.2 and 5.5.

More recently Porto Alegre has also participated in another ICLEI project that is being funded by the Renewable Energy and Energy Efficiency Partnership (REEP). The project has developed a guide for the City to follow as it begins to plan to transform gases in waste water facilities into renewable energy.

Given its initiatives and location not only in Brazil but the continent, Porto Alegre in the Network has a very strategic role. In the short time as a Model Community, the City has already hosted an international seminar that has brought representatives from neighbouring countries to learn more about renewable energy. Unlike Brazil, the Countries of Argentina and Uruguay do not have a great source of energy that could be sold cheaply. For this reason, these countries are focusing on alternative energy sources and energy efficiency projects. Porto Alegre is not only gaining from information that is being shared from its borders but it is also serving as example to its neighbors, thus amplifying the promoting power of the Network to the rest of Latin America.

2.3 Staffing within the city government

In order to become a Model Community, city governments must agree to assign a political liaison and technocrat to be the Model Community's main points of contacts with ICLEI, other Network Communities, stakeholders, community members and others.

Usually the technocrat staffs the reference center on renewable energy that is created by the city under the Local Renewables Network. In the case of Porto Alegre, the political leadership thought it best to share the responsibilities of the center and Network between three staff members coordinated by the head of the Environmental Secretariat's Air and Water Department. Although none had had substantial experience with renewable energy and energy efficiency, they were all very willing and excited to learn and participate in the innovative project. All three technocrats are chemical engineers and often count on colleagues from the Environmental Secretariat and other institutions to provide supports in other fields such as education, event planning, energy and etc.

The model of shared responsibility has worked relatively well although one of the main shortfalls of shared responsibilities is that all of those involved have non-renewables matters that they tend to. At times this led to giving priority to other urgent matters, leaving the

renewable center and its activities as a second priority. However, it had benefits that could not be denied. The Secretary considered a risk analysis of future unforeseeable events that could make one staff person not available. This was proven throughout the project when one of the three staff members suffered an unfortunate health issue and did not work for a few months. If that person had been the only person assigned to the project, less progress would have been obtained. Towards the end of ICLEI's active participation in the project a fourth person was assigned to the center with the aim of strengthening their link with climate change issues.

It is also interesting to note the care that political leadership gave to staffing the renewable energy center and measures that were taken to avoid issues that had arisen in the past. The Secretary of Environment intentionally chose two staff members that are permanent public servants who do not suffer the possibility of being substituted with a change of government. Given this selection, it is more likely that permanent public servants instead of politically appointed staff members will be able to continue with the project regardless of change of government and parties in power. This not only allows more stability and replication power but it proves that political leadership took a mature decision to place the issue of sustainable energy above party politics.

2.4 Project history in Brazil

The inception of the Local Renewables Model Communities Network in Brazil differs a bit from the Indian Cities roots. Before the project involving Indian and European Cities commenced, ICLEI ITC staff shared the LR Network proposal with ICLEI colleagues in Brazil who were able to receive financial funding from the British Government's Global Opportunity Fund (now the Strategic Program Fund) through the British Embassy in Brasilia in 2005. Thus when the LR Network project began in India and Europe, activities in Brazil were already underway. The activities started with Betim as model community and Porto Alegre being a so-called "satellite city", which was invited to observe and share results. (The project history is described in length in the Brazilian country report.)

.At the end of **2007**, the first phase of the project with ICLEI's participation came to a close and the interaction between the cities also became dormant but their work on renewable energy (RE) and energy efficiency (EE) continued to a certain extent.

In **2008** with the generous support of the **German Federal Ministry for Economic Cooperation and Development** and the GTZ, ICLEI revived the Local Renewables Network in Brazil. The German government had already been supporting the Network's activities in India and Europe since 2005 and saw great potential in continuing to expand the Network in Brazil.

During this second phase that spanned from 2008 – 2010, Porto Alegre, the Capital of the State of Rio Grande do Sul graduated from being a satellite city to the 2nd Model Community in Brazil. This decision was made through a selection process led by ICLEI Brazil.

Since then Porto Alegre has worked on LR policies, has set-up a LR Resource Center (CRER) and has started a variety of activities, as being described in the following reports.

3 Activities of Porto Alegre as a Model Community in brief

With the support of ICLEI and the GTZ, the below tool – an Impact Chain - was developed to help guide the activities of the model community. Porto Alegre developed their work plan and activities based on the four indicators of success listed in the chart below. The indicators were determined by the proposal that was agreed to at the beginning of the project between ICLEI and the GTZ. At least on a monthly basis the City's Renewable Energy and Energy Efficiency Reference Center (Centro de Referência em Energias Renováveis e Eficiência Energética – CRER in Portuguese) staff and ICLEI representatives took stock of progress by updating the Impact Chain, determining which activities were finalized and developing next steps. This chart was displayed in the Center and proved to be an inspirational visual tool as well as a guide to keep staff focused. It allowed project participants to visualize when planning or action was needed.

The chart on the following page depicts Porto Alegre's Center activities after it was last updated. Since this is a dynamic tool, changes in the activity section will change continuously.

LR Network – Porto Alegre Impact Chain

Indicators

| | | | |
|--|--|---|--|
| <p>At least four model communities (two in India and two in Brazil) have developed and approved politically, in a participatory multi-stakeholder process, a local energy strategy which gives a prominent role to energy efficiency and the generation and use of renewable energies.</p> | <p>At least two model communities in Brazil and two in India have established a competence centre for energy efficiency and renewable energies, and each has at least one qualified member of staff.</p> | <p>The proposals of each competence centre are adopted and implemented by at least two private (or local government) companies in each model community.</p> | <p>The model communities have been integrated into an international network of local authorities. Specifically, this means that the network has access to significant outcomes and experience via internet portals, and members of the network have personal working contacts to the other members, i.e. experience and findings are exchanged, and members know their network contacts on specific issues personally.</p> |
|--|--|---|--|

Line of Work

| | | | |
|-----------------------|--|--|--|
| 1. RE and EE Policies | 2. CRER - Reference Center of Renewable Energy and Energy Efficiency | 3. Renewable Energy and Energy Efficiency Projects | 4. Strengthening of the international LR Network |
|-----------------------|--|--|--|

Activities

| | | | Betim, Porto Alegre & ICLEI Brasil |
|--|--|--|--|
| Policy on Reduction of Emissions (Complementary Law n° 560 - Programme to encourage the use of solar energy in buildings - not regulated) | Projects on Renewable Energy and Energy Efficiency in schools, with an Environmental Education team from SMAM and CEEE: syllabus + booklet | Extending project for reuse of cooking oil as biofuel | Capacity Building on Networks (why and how) for cities |
| Participation in the Municipal Plan for Energy Management (PLAMGE) through a municipal energy management unit - Ugem | Permanent Rounds of debate on Energy Consumption, "Energia em Debate" | Construction of low-income housing with solar water heaters through the PAC, "My Home, My Life" | Convening Communities Model to share information on the installation of solar water heaters in the houses under the Program "My Home, My Life" |
| Review and implementation of measure to encourage the installation of solar panels instead of reforestation under the law of environmental compensation for construction works (Art 22 - Law 15.418) | Capacity Building for SWH designers (Course Solar Cities) | Implementing an Internal Commission for Energy Management (CIGE) in the Municipal Secretariat for the Environment (SMAM) | Exchange between São Paulo and Model Communities on legislation for Solar Water Heaters |
| Solar Water Heater Policy | Mobilizing real estate companies | Pilot Project: implementing solar energy in SMAM building in the center | |
| Law on Reduction of GHG Emissions (10.320) | Follow up on projects presented to CEEE | Implementing solar heating in DEMHAB housing unit | |
| | Catalogue of solar energy services and products | Project Conpet (Emissions Reduction and EE) | |
| | | Implantation of Wind Power in SMAM Conservation unit | |

4 Citywide energy assessment / City energy report: Understanding Porto Alegre's energy usage patterns- past, present and future

In order to know where best to invest time and resources, it is important to understand the needs and where opportunities lie. Knowing the importance of having trustworthy information to feed into the Model Community's strategy and work plan, a consultant was hired by ICLEI to conduct a study on challenges and opportunities associated with renewable energy and energy efficiency in Porto Alegre.

4.1 Study on challenges and opportunities for RE and EE in Porto Alegre

This study was so helpful in discovering relevant information and resources that both Porto Alegre and Betim have determined that they will update the study at least every two years.

Following are the steps that were taken to develop the "Study on Challenges and Opportunities in Renewable Energy and Energy Efficiency in Porto Alegre":

- development of an outline of the study which was approved both by ICLEI and Porto Alegre;
- broad research on RE and EE in Brazil and the world (its importance, what is available, basic definitions, existing laws and regulations) was done in order to convince readers of its importance;
- local research on state and municipal laws, master plans and others involved with RE and EE;
- development of a questionnaire and list of interviewees that was approved by ICLEI and Porto Alegre; and
- interviews with relevant stakeholders from all sectors.

Beyond identifying challenges and opportunities, the study also recommended further actions in accordance with the information that was researched. Recommendations in the following areas were given:

- education and outreach;
- financial incentives;
- policy development;
- political and structural aspects; and
- technology.

Through the CCP Campaign cities complete a greenhouse gas emissions (GHG) inventory, set a goal to reduce or avoid emissions, and establish an action plan to implement measures. Porto Alegre completed the first milestone in 2003, choosing 2000 as a base year for its inventory. It set a goal to reduce GHG emissions by 10% below its base year by 2010. Data obtained in 2004 already indicated a reduction of 1.62% of CO₂ equivalent between 2001 and 2002. The table below shows the results of the GHG inventory.

Table 4.1: Results of Porto Alegre’s GHG inventory using 2000 as a base year. The table shows tons and % of CO₂e by sector.

| PORTO ALEGRE: GHG INVENTORY | | |
|--------------------------------|-------------------|------------|
| Year | CO ₂ e | |
| 2000 | tons | % |
| Residential | 276.978 | 13,7 |
| Commercial | 130.128 | 6,4 |
| Industrial | 206.659 | 10,2 |
| Transportation | 1.371.415 | 68,0 |
| Waste | 32.448 | 1,6 |
| Total | 2.017.628 | 100 |

4.2 GHG inventory

Since the beginning of the project, staff and political leadership have been working toward an update of their GHG inventory, which is another important tool in identifying the city’s energy needs and challenges. Although the CCP was very well received in Porto Alegre, it was ahead of its time. Developing an emissions benchmark was not as common then as it is now.

The importance of such an activity has become more prominent in the later half of the decade after the publication of the Intergovernmental Panel on Climate Change (IPCC) Report in 2006 which reported devastating and worrisome scenarios predicted due to climate change and the release of Al Gore’s movie, *Inconvenient Truth*.

Since then there was a media frenzy with climate change issues in Brazil and in other countries that have a strongly influence the Country. Now that the Federal Government and other states and cities such as Belo Horizonte, São Paulo and Buenos Aires have not only developed their inventories but have also set up climate change forums and action plans that have gained much media attention, others are following suit in order to not be left out. Given that it has become more of a mainstream activity for cities, it is understood that Porto Alegre is ready not only to update its inventory but also to keep it current and develop targets that will be monitored. Climate issues are at a mature stage in Brazil right now that such activities are not seen as superfluous.

Another challenge faced by Porto Alegre in regards to its GHG inventory is related to staff. Only one staff person was assigned to the development of its inventory with ICLEI Brazil in early part of the decade. Since then this person, who was a permanent staff member passed away. CRER staff carefully sifted through files to salvage work that had been done but their efforts did not render much results. Given this situation, the argument to have a shared responsibility system as mentioned above in section 2.3 “Staffing in the City” is strengthened.

Despite the difficulties mentioned above Porto Alegre has taken commendable steps to further its work on climate protection issues which subsequently involve to a great extent, sustainable energy. On 10 December 2007, the Environmental Secretariat and Mayor approved Law 10.320 which creates the **Municipal Program on Prevention, Reduction and Compensation of CO₂ Emissions and other Vehicular GHGs**. Since the City’s GHG inventory revealed that a whopping 68% of its emissions stems from the transportation sector, a focus on vehicles is understandable.

More recently (in early 2010) CRER and ICLEI have met with staff from a City Council Member that is exploring the creation of a Porto Alegre Metropolitan Area Climate Change Forum. Several suggestions were made including already using existing groups to focus on the issue instead of creating *another* group. For example, the State of Rio Grande do Sul has already established a state level Forum its progress has been stomped. It was advised to understand better the difficulties the state forum faced and understand if a metropolitan group could build up on their efforts and structures that are already in place. The Council Member is also meeting with the metropolitan association's president, a mayor from one of the surrounding cities to explore the possibility of addressing climate change through its already established structure. CRER is a natural partner that has already committed its support to these efforts.

5 Policy development and target setting: Committing to energy reduction and setting reduction targets citywide

(Indicator 1)

Due to CRER – PoA's limited experience with renewable energy policies, they invested time in understanding processes and researching existing policies. They have partnered with the Secretariat's legal department to first better understand the process to be implemented.

A workshop on legal processes was administered on 4 November 2009. During this period CRER staff were educated on the different kinds of policies, how to develop each, who was in charge and participated in the process, the time, resources and information needed to work on the diverse array of policies. They also uncovered several policies related to renewable energy and energy efficiency that had already been approved by the City Council but not enforced. For these pieces of legislation they spent more time with those involved in the process of elaboration to understand why the laws had not been enforced.

In Porto Alegre the focus on policy development has been on the:

- Review and enforcement of a policy which establishes the Incentives Program for the Use of Solar Energy in Buildings (Law 560)

CRER has also worked on the:

- Review and enforcement of a measure that encourages the installation of solar panels to compensate land use (Article 22 of Law 15.418),
- Establishment of a solar thermal energy policy,
- Review and enforcement of a Law which creates the Municipal Program on Prevention, Reduction and Compensation of CO₂ Emissions and other Vehicular GHGs (Law 10.320),
- Participation in the Municipal Plan for Energy Management (PLAMGE) through a municipal energy management unit (UGEM).

It is worth noting that all three of the existing laws (560, 15.418 and 10.320) now being worked on by CRER were drafted and approved between 2006 – 2007, when the first of the Local Renewables project was in full speed. One may stipulate with a great degree of certainty that these policies were developed under the influence of the Local Renewables project since several staff members and political leadership had been to Betim and had close contacts with São Paulo that at that time was drafting their own solar energy policy.

The former Secretary of Environment was very much involved himself and participated in several ICLEI events such as the first international seminar on renewable energy in Betim in June 2006, ICLEI's World Congress and official launch of the Local Renewables project in Cape Town, South Africa in February 2006. This is an example of the replicating power that the Network has and how it is important to invest in the cities involved from the onset, rendering results by deepening efforts before expanding it to include others. Just as important as the first phase was to approve policies is the process of enforcing them. If ICLEI Brazil had selected another city to be the second Model Community, this groundwork would most likely have been in vain since there would not have been staff dedicated to energy issues as there are now through the project.

Local Renewables Project Indicator 1:

Formulation of an 'Energy Strategy' for Porto Alegre

Under the LR project, the first indicator of success involves the development and political approval, in a participatory multi-stakeholder process, of a local energy strategy which gives a prominent role to energy efficiency and the generation and use of renewable energy.

The Municipal Environmental Secretariat of Porto Alegre via CRER opted for a long term strategy, building internal capacity on legislative processes, creating and strengthening bonds with important partners and uncovering and understanding existing legislation before establishing new and more comprehensive ones. This continuously sets a firm base for legitimizing CRER's position in promoting Local Renewables.

Even though Porto Alegre is a pioneer in fostering solar energy policies, it has had difficulties in enforcing them. By uncovering dormant legislation, CRER is opening a path to review Law 560 which encourages solar energy in buildings. It is also pressuring for the enforcement of laws 15.418, which encourages installation of SWHs. Its main priority now is to work with its stakeholder group in creating a decree to regulate law 10.320 on GHG which creates a program to control emissions from vehicles.

Having gained recognition from local actors, CRER was invited by the Municipal Secretariat for Planning to participate in the Municipal Energy Management Unit, which is in the process of establishing the Municipal Plan for Energy Management, a unique opportunity to advance Energy Efficiency and Renewable Energy in Porto Alegre.



Picture 5: CRER – PoA's multi-stakeholder group discusses solar energy policy

5.1 Porto Alegre's policies within the Brazilian context

One might ask why if it is not more fruitful for the reference centers to work on policy that covers both solar thermal energy (for the purposes of heating water) and photovoltaic (for the purposes of generating electricity). The answer is that Brazilian local governments have no authority to define their energy sources when it comes to the electricity grid. This decision is made at the federal level and may be only slightly influenced by local leaders, although there is a new, very recent movement to challenge this. Porto Alegre focused its policy work in areas where they have direct influence.

We provide a broad overview of the current issues that Brazil is facing in regards to energy that will become more and more relevant with the passing of time and merits the attention of the CRER.

Brazil's Law 12.187 approved in December 2009 created the National Policy on Climate Change (PNMC), which establishes voluntary goals for reduction in GHG emissions by 36,1% to 38,9% in relation to emissions projected for 2020. As a basis for the PNMC, the 2008 National Plan on Climate Change presents studies and national instruments to mitigate emissions across all sectors, including energy. It states that even though 45,8% of Brazil's energy is renewable, emissions from this sector can be cut through the substitution of carbon sources (usually used for heating showers during peak hours) for clean energy.

RE and EE face unique challenges in Brazil: Although Brazil is the 5th biggest emitter of GHG in the world, this is due to the Country's deforestation practices and not energy consumption as is mostly the case for the other top emitters. In fact, Brazil's energy production is considered to be relatively clean since its main source of electric energy is derived from hydro-power. However, there have been a number of studies declassifying hydro-power as a clean energy source since high amounts of methane and carbon dioxide are produced as a result of the flooding of reservoirs. In addition, hydro plants have been villainized by many since they force local communities to migrate, causing social and economic hardships to those who have been displaced.

The National Policy on Climate Change also foresees a Strategic Plan on Energy Efficiency aiming to reduce national energy consumption by 10% until 2030 (approximately 106 TWh (tera watt hours) through energy efficiency projects. Among these actions are incentives to use solar water heaters (SWH). It is foreseen that the installation of SWHs will decrease the necessity for new hydroelectric plants. It is estimated that a national SWH program combined with other actions can reduce energy consumption during peak hours by 1,200 MW and represent a total cut of 2,500 GWh/year by 2015, which would result in an annual reduction of 460,000 tCO₂e.

Another issue to be pointed out is that Brazil's energy consumption is drastically increasing due to its economic growth and it is expected that hydro energy will no longer be able to meet increasing demands. In 2001 Brazil suffered a country-wide crisis when lack of rain led to low water levels in reservoirs which in turn resulted in a black-out. Since then the Federal Government has invested in several programs to diversify the Country's energy sources, including wind energy and energy efficiency measures.

Another important reason to **focus on solar heaters** is that heating water consumes a huge amount of energy. Approximately 6% of national electricity consumption is traced back to water heating that is in its majority used for showers since consumption of heated water in bathroom and kitchen sinks are not the norm. Since most take showers at the same time of the day, electric showerheads are responsible for 18% of electricity consumption during peak hours. This means that additional resources are solely invested in order to supply electricity for showers during these time slots. Usually the more polluting and expensive thermoelectric plants that run on oil, gas or coal are used at this time. On some level, or at least propagated by the electric showerhead industry, this equipment is being sold as a point of national pride since it is a homegrown invention that is used in about 73% of all Brazilian households.

Currently 12 million electric shower equipments are purchased annually in Brazil where as solar heaters only reach 300 thousand per year. Given these data, the motives to promote alternatives to electric water heaters are strong and if successful, such a policy would achieve great energy savings and a drastic reduction in GHG emissions.

Following we discuss each of Porto Alegre's policies.

5.2 Reviving Law 560 – pioneer work of Porto Alegre

In line with its leading environmental spirit within Brazil, Porto Alegre was the first city in Brazil to approve a law that promoted the use of solar energy in 2007. Law 560 of 3 January 2007 instituted the Incentives Program on the Use of Solar Energy in Buildings. Its objective is to promote necessary measures that foster the use of and development of solar thermal technologies as well as to develop an outreach program on the benefits of solar power.

Over 100 cities followed Porto Alegre's lead, approving such laws. Although Porto Alegre can be proud of being at the forefront of promoting such measures, it can be less enthusiastic about its track record after the law was approved. Out of the six cities that have enforced solar energy laws, Porto Alegre is not one of them. In order to facilitate the legal process, many laws contain few details on its implementation. Regulations are set in a decree, which officially enforces the law.

According to legal procedures, in order to enforce the law, a decree regulating the incentives program would need to be drafted and approved. Many outside institutions have continuously tried to push Porto Alegre towards action. For instance, Friends of the Earth Brazil Nucleus (*Núcleo Amigos da Terra Brasil - NAT*) and *Cidades Solares*, which helped Porto Alegre to draft Law 560 have lobbied for the enforcement of the law for years. Since the approval of the Law, Porto Alegre established a governmental work group to discuss next steps. But no progress was made. Although the law was signed by the Secretary of Public Works and Transportation, in 2008 non-governmental groups have asked for the Secretariat of Environment to become more involved in pushing for regulation. Although efforts were taken, the law was not enforced, mostly because progress depends on the action of other secretariats. Another difficulty that the Environmental Secretariat faced in early 2008 was that there was no staff directly responsible for renewable energy. This changed when Porto Alegre inaugurated its reference center on renewable energy under the auspices of the Local Renewables project. Now the environmental leadership of the City is armed with support staff that can work with other secretariats and coordinate efforts to finally enforce Law 560.

First, CRER staff communicated their intentions of regulating the law with the Center's multi-stakeholder group on 9 February 2009. It was agreed that CRER's involvement in the issue was very relevant. At the meeting the NAT representative that was directly involved in the drafting of the law was present and gave an overview of its history which was very helpful. CRER staff organized another meeting with the multi-stakeholder group to begin to draft the regulating decree in April 2010. However not much progress was reached since the group did not have a proposal of a text to work with.

The next step is to draft a decree within CRER which will be reviewed by legal staff. This is scheduled to occur in July 2010. Following CRER will call a meeting with the multi stakeholder group to discuss the text and make proposals in August. The importance of this step must not be underestimated. Over and over again, it is witnessed that public policies that are developed without the involvement of those whom it will affect are less effective or more problematic to be implemented. Even if developed with good intentions, if stakeholders are not consulted, it is likely that the policy will suffer resistance and resentment for lack of consultation. Also, in a country where a plethora of laws are approved but not enforced, many are rightfully weary of lawmakers who merely develop legislation for personal means and photo opportunities. In addition, such events allow the public sector to better understand the needs of those it will affect in order to draw up more effective legal instruments. The exchange process enriches the end result. Although it is expected that certain conflicts will arise among the different parties, it is best to find solutions as early as possible and not wait for the final phase.

Once the consultation with the larger group has come a close, CRER will again consult with its legal department before the decree is sent to the Secretary for approval. Then the decree will be shared with all governmental institutions through a service order. If anybody has any

objections or questions, it must be raised within a seven-day period. If there aren't any objections the bill will be sent to the Mayor for approval. The goal is to have this process completed before the end of 2010.

5.3 Incentives for solar energy

CRER staff also came across an incentive for the use of solar thermal energy that is little known.

Law 15.418 of 20 December 2006 pushed forward by the Secretariat of Environment establishes the procedures that need to be followed to prune, transplant or compensate the removal of vegetable species under several conditions including construction of new buildings.

Porto Alegre is very proud of being one of the most arborized cities in Brazil, if not the world and this law sets out very precisely in 39 articles regulations that need to be followed in order to protect the City's vegetation. The law determines conditions to compensate for removal of vegetation for those who are building on an area that contains green areas. The law is accompanied by an attachment that describes how much of each kind of species needs to be compensated. Article 22 of Law 15.418 puts forward an innovative policy stating that the builders will only be required to compensate half of what the law requires in its attachment if the building meets at least two of the following conditions:

- uses certified wood
- reutilizes rain water
- uses at least 30% of solar energy

CRER Staff were excited to learn about article 22 of Law 15.418 and began to research if it had been put to use in the City. They learned that only a few constructors had made use of the article and only had to compensate half of the species through the use of solar energy.

But in these cases, they discovered that the builders were already planning to use solar energy. Thus they were not influenced by the policy but only took advantage of the conditions it set out for what they were already going to do. Wanting to understand why this incentive was not being taken up by the building sector and homeowners, CRER met with their colleagues from the Environmental Secretariat that are in charge in enforcing the law. When asked why the population at large is not taking advantage of article 22, it was discovered that the technocrats who are biologists and agronomists have not been promoting the article since they have difficulties in defining how to consider if the construction will in fact use at least 30% of solar energy. They believe that engineers from the Secretariat of Public Works and Transportation are better equipped to judge if article 22 is being duly followed in order for the incentive to be given.

CRER staff are working on finding solutions to the issues that article 22 presents since they believe that it is a policy that could help to promote the use of a form of renewable energy. Thus they are in negotiation with those involved in order to define who should be in charge of inspection. CRER is also working with those involved in the process to determine how this law could be better promoted to the population. An idea has been to develop a flyer that would be handed out during the construction approval process.

5.4 A new proposal for a more ambitious solar energy policy

There are pains at being at the forefront. As stated in section 5.2, Porto Alegre was the first City to approve a law to promote the use of solar energy. Law 560 loosely defined the Solar Energy Program. According to the NAT representative who participated in the drafting process and is a member of CRER's multi stakeholder group, this occurred because there was resistance from the City Council. Afraid of backlash at a time when other cities had not yet tested the waters, the legislation only passed after it was watered down.

It is believed that the City Council would be more favorable to passing a more ambitious piece of legislation now for several reasons. Since then other solar energy initiatives and policies have been pushed in Porto Alegre. Also other cities have passed more forceful legislation which has set a new benchmark for Porto Alegre. The City has also been set at ease by the experience and acceptance by most sectors that others have had. The Local Renewables Network has been successful in promoting the benefits that low-income communities have enjoyed as a result of solar thermal energy.

For example, in Betim where the municipality established a partnership with their energy provider to install solar water heaters in 1356 low-income housing units, CRER staff conducted a research project that revealed that the average consumption of electricity for a household of 4 persons was of 98 KW/month with the use of conventional electricity. After the installation of the solar panels consumption fell to 74 KW/month, representing a reduction of 24 KW per month. In financial terms, the bill which totaled R\$²79 (about € 35) a month was reduced to R\$ 33 (about € 14) a month, resulting in monthly savings of R\$ 45 (about € 20) per family. Such a savings makes an enormous difference for these families that on average earn less than R\$ 1,000 per month. With such positive results it is understandable why the research project also determined that practically all of those who were interviewed demonstrated satisfaction with their solar heaters³. On a national level, the Federal Government is now more open to solar thermal energy, including the technology in massive housing projects that are being foreseen for 2011 and also through its very much spoken about Climate Change Plan.

CRER is committed to pushing this forward but is currently gaining strength in forming strategic partnerships and gaining experience that will allow them to weather opposition.

Center staff would like to sponsor in the near future a policy that mandates solar thermal energy to be used on a wider scale. In short the policy would force the construction sector to install the piping needed for solar heaters into the structure of buildings. One of the most cited examples of such legislation is from the City of São Paulo in Brazil. São Paulo's legislation came into effect in 2007 and was based on Barcelona's solar energy law. In São Paulo's case, the Environmental Secretariat established that all new buildings in the city containing four bathrooms or more must be solar-energy ready. This means that homeowners will not have to tear down walls to install the needed piping, an intrusive renovation considered to be one of the biggest drawbacks in the installation process. If the piping is made available by the construction company, future owners will only need to make an investment of about R\$ 2,500 (€ 1,140) to purchase the solar panel and cover the installment costs. São Paulo defined the criteria of four bathrooms in order for the law to specifically be applicable to high-middle class families which have the means to pay for the equipment. Also, it is argued that if the higher classes use solar energy, other classes will follow suit, seeing it as a fashionable purchase. Betim and Belo Horizonte are currently working on similar bills.

2 The currency in Brazil is called Real in singular and Reais in plural.

3 For more information on the research project, see ICLEI's Case Study 112.

5.5 Municipal program on prevention, reduction and compensation of CO₂ emissions and other vehicular GHGs

Alongside their work on the solar thermal decree that will enforce Law 560, CRER also began to work on enforcing Law 10.320 of 10 January 2007 which creates the Municipal Program on Prevention, Reduction and Compensation of CO₂ Emissions and other Vehicular GHGs.

This is another example of a law which was not enforced due to lack of follow up needed, which is unfortunate given the relevance of lowering emissions from the transport sector. In 2000 transportation emissions in the City ranked far higher than all other sectors at 1.371.415 tons. This scenario has surely not improved. It is estimated there has been a 35% increase in the amount of vehicles that transit in Porto Alegre. In 2001 481.914 vehicles were counted; at the end of 2009 this number rose to 653.329. On a more personal level, this means that there is a vehicle on the road for every two *Porto Alegrenses* – which reaches the rate of City of São Paulo which has by far the worst traffic conditions in the Country.

Eager to make progress, CRER drafted a decree that was shared with its political leadership. Upon discussion it was agreed that the Center would put their work on this law on hold for several reasons. One, since staff members did not have any practical experience with law enforcement, they thought it best to first, learn from their mistakes, successes and progress with the enforcement of Law 560. This way, they could focus efforts on one particular piece of legislature with the hopes that it would be done in better time. Working on more than one law may take more time to reach an end to either one.

Another more complicating reason why CRER put on hold their work on Law 10.320 is due to its contents. It was raised that the Municipality should work on legislature that addresses GHGs in a broader scope, while the law at hand focuses on CO₂ and vehicular emissions. The law has considerable language on bio fuels as an alternative for vehicles. It mandates that an inventory on CO₂ and other vehicular GHGs should be done on an annual basis and that reduction goals should be set. Given the advances in climate change discussions on the national scenario, it is considered that Porto Alegre may develop a law that focuses on green house gases as a whole. Enforcing this law may take precious time that could otherwise be used to attain greater results on a broader scale. This discussion will be taken up again once CRER's work on solar thermal energy policy draws to an end.

5.6 Municipal plan for energy management (PLAMGE)

One of the actions taken by the Federal Government to promote energy efficiency is supporting municipal administrations to implement programs on energy management.

To reach their goal of promoting energy efficiency, the Program to Combat Electrical Energy Waste (PROCEL) has promoted and elaborated several technical guides and other tools for municipalities to use. Porto Alegre has taken up this call and through the Planning Secretariat has begun to develop their Municipal Plan for Energy Management (in Portuguese - *Plano Municipal de Gestão Energética* – PLAMGE).

The Plan will be elaborated by the Energy Management Unit (in Portuguese – *Unidade de Gestão Energética* - UGEM) that needs to be created. Among its responsibilities each UGEM coordinates the activities set out in the PLAMGE, organize outreach activities and trainings, and provide support for the Internal Commissions of Energy Management (in Portuguese – *Comissões Internas de Gestão Energética* – CIGEs) that are created in municipal buildings. These commissions implement actions to reduce energy consumption, set goals and monitor their results. Porto Alegre's UGEM is currently being set up and CRER has been invited to participate.

6 Action planning and implementation: Designing a path to achieve reduction targets

6.1 The MoU as basis for the cooperation

Political commitment of the City's leadership has been vital to the activities of Porto Alegre as a Model Community. Although the project began in 2008, both ICLEI and Porto Alegre thought it was important to send a public message that Porto Alegre supports renewable energy and energy efficiency. Thus a public signing of the MoU took place in **April 2009** during the *Minha Casa Minha Vida* event in Brasilia, marking the newly elected city government's renewed and strengthened commitment to continue the project. The document was signed by the Secretary of the Environmental Secretariat. The document defines political and technical liaisons responsible for the execution of the work plan. In Porto Alegre's case the Secretary of the Environmental Secretariat and the manager of the CRER were selected.

This public signing did not only demonstrate the City's commitment to continue to implement the Local Renewables project. It was a clear expression of the new City Government to continue the previous government's policy on renewable energy. Such a continuation is often times not respected due to party politics. The signing symbolized that renewables was able to rise above party lines in Porto Alegre.

In so far this continuation is not only a success of the project but also a signal to many more cities in Brazil that promoting RE and EE is key for modern policy work and should not be subjected to differences between political parties.

The MoU defines the following as the main steps to be implemented:

- Involving and mobilizing stakeholders in the process as well as being the driving force in gearing information sharing and partnerships among them;
- Developing and implementing local policies and projects for renewable energy and energy efficiency;
- Establishing a renewable energy and energy efficiency reference center as a place to learn, showcase practical applications, and to provide technical expertise; and
- Implementing training and outreach activities.

6.2 Work planning

One of the first steps that was taken at the beginning of the project was to establish an **annual work plan** that was developed by ICLEI and Porto Alegre. The work plan was systematically updated and received recommendations from GTZ representatives as well as CRER's Advisory Group. The work plan outlined the activities listed in the Impact Chain chart (see *chapter 3*). In addition to the policy work explained in detail in chapter 5, the work plan also took into account activities in the implementation of projects, outreach and network development.

Once CRER began to contact relevant stakeholders, one of the most noted comments was the relief that a reference center on RE and EE was setting up base in Porto Alegre. CRER staff discovered that the City was bustling with well meaning institutions developing interesting and important work in the field. But they were all working in an isolated manner, not making the most of information and resources available to them via potential partners. Thus many have come to appreciate CRER's role as a clearing house that can serve as a nucleus of information for academics, private institutions, the energy sector, NGOs, and

other governmental institutions in as well as outside of Porto Alegre. For this reason, at this early stage CRER in Porto Alegre has been involved in following up on activities that are already in place and making connections between relevant people as well as gain practical knowledge from the field. This is also important since CRER can also monitor these activities and act as a pressure mechanism that pushes for results.

For the implementation of the activities, please see chapter 8.

7 Porto Alegre Renewable Energy and Energy Efficiency Reference Center: A key actor during project implementation

(Indicator 2)

Local Renewables Project Indicator 2:

The Reference Center in Porto Alegre

Under the project, the second indicator of success involves the establishment of a reference center for energy efficiency and renewable energies, with at least one qualified member of staff.

In Porto Alegre, this indicator was fulfilled beyond expectations. Understanding the importance of renewable energy and energy efficiency, the Center is staffed by three engineers who respond directly to the Municipal Secretary for the Environment. Learning from its predecessors, model communities that have already established a centre, one of CRER – PoA's first actions was to establish a multi stakeholder group that has championed the centre's cause to a broad audience.

With great support from political leadership, CRER was inaugurated in September 2009. It is located in the Secretariat of Environment's main level. A particularity of the Centre is that it is housed in the Secretariat's library which has over 10 thousand volumes and receives a wide array of visitors. In addition, the Center showcases several models of renewable energy equipment.

7.1 Reference Center: Concept, set up, partners, funding and activities

One of the selection criteria for Model Communities is the commitment of the local government to allocate its own resources, including staff, office equipment and office/exhibition space. This allows the cities to build internal capacity that will remain when the more active participation of ICLEI comes to an end.

Porto Alegre, as the other Model Communities, has allocated staff capacity to the project, mainly through the Reference Center (CRER - PoA). Throughout the project, the Center's staff were involved in the promotion of RE and EE, policy preparation, and the implementation of projects. The CRER was established under the structure of the Municipal Environmental Secretariat and its team report directly to the head of the Secretariat. Both the CRER team and the Secretary worked closely together with ICLEI staff, responsible for the implementation of the project along with project funders.



Picture 7.1: CRER - PoA Team and the Municipal Secretary for the Environment at the Launching of the Center

CRER was designed as a hub for information and the promotion of RE and EE technologies in order to inspire other cities. Since its inception, the Renewable Energy Reference Center has served as an important tool to raise the local and regional population's awareness about how local actions related to RE and EE may be a great step to reversing the global tendencies of climate change.

Responsibilities and activities of the Porto Alegre Reference Center:

- To provide information to all those interested in knowing about RE and EE
 - by acting as a display and exhibition space for information and models on RE and EE; and
 - by creating a comprehensive resource base of information on renewable energy and energy efficiency (database, library, etc.).
- To facilitate exchange and collaboration between different stakeholders and to develop and maintain a network of all the actors for effective information sharing, technology transfer and fund mobilization,
 - organize workshops and seminars;
 - organize meetings; and
 - organize study visits.
- To act as “anchor” for the local stakeholder group;
- To reach out to different target audiences, such as
 - municipal corporations/departments;
 - local utilities, local business;
 - developers of large-scale construction projects;
 - architects, city planners;
 - city residents and resident welfare associations; and
 - school children.
- To draft proposals for project activities to implement the action plan;
- To oversee and organize implementation of proposed activities: including pilot demonstration projects and awareness programs; and
- To monitor the performance and impacts of implemented activities such as pilot demonstration projects.

In Porto Alegre, the establishment of the Reference Center has been extremely beneficial to the local authority, and has helped to direct their vision in RE and EE.

Currently, the Center is located in the Secretariat of Environment which is housed in a building on its own. It was officially inaugurated in September 2009 under the auspices of the city's first seminar on sustainable energy. The Center has been allocated on the main level of the building within their library on environmental issues. This is a strategic location since the library receives a wide array of visitors – from academics, students, public servants, community members and business people. The library has over 10 thousand volumes of references that focus on issues such as environmental law, soil management and educational resources. More recently, their energy section has grown to include more books, DVDs and other references on sustainable energy. In addition, the Center houses several models of renewable energy equipment.

7.2 Partnerships and stakeholder involvement for local activities

Porto Alegre was able to learn a great deal with its predecessors. Several exchanges occurred with the first Model Community in Brazil – Betim as well as the Centers in India. Some of the tools and activities that took place in these other cities were replicated in Porto Alegre. Diverse strategies to assure that the Center would be successful in achieving its goals and objectives. Among these strategies was the creation of a stakeholder group (SG) (*Grupo Consultivo - GC*).

7.3 The Importance of the stakeholder group

Without the stakeholder group's participation, the implementation of actions and the running of CRER would be at stake. For bodies like CRER, joint action is fundamental since it is possible to steer actions for the development of sustainable energy public policies through the interaction of multiple stakeholders.

The involvement of multiple stakeholders enables the analysis of deficiencies and the potential of initiatives. It is, therefore, possible to envision options that will result in more effective actions.

SG's collaborative model allows for organization, acknowledgement and strengthening of actions. The potential for action is also enhanced, given the SG's greater scope, which encompasses diverse segments of society.

Another benefit of the multi-disciplinary role played by SG, within which there are different levels of knowledge, is the possibility of joint learning.

SG's dynamics incorporate interested parties in the process and create a formal channel for their participation. Therefore, it serves as a forum for interaction, negotiation, debating of issues and fosters the search for solutions.

The cross-sector set up presents an important contribution for the creation of better conditions for a cooperative logic and to give a voice to civil society as well as to engineers and specialists who work in related fields. The result is the improvement of access to information and greater inter-sector integration.

CRER's stakeholder group is responsible for:

- overseeing the execution of activities carried out by the Center, with the possibility of evaluating them and indicating priorities for action;
- promoting and disseminating CRER's activities and information of interest related to the theme of sustainable energies;
- submitting proposals for action and activities to be carried out jointly with CRER;

- taking steps to establish contact with relevant institutions in order to form collaborations; and
- notifying CRER about their actions that are related to the theme of renewable energies.

The objectives of having the SG's participation in CRER are:

- to involve key stakeholders in the debate on sustainable energy;
- to facilitate the integration of sustainable energy as a government policy, thus ensuring its implementation; and
- to provide useful information and advice on sustainable energy.

The stakeholder group is composed of members from different segments of society, chosen according to their relevance and their ability to provide substantial support for the development of the project, namely:

- Technical or political representatives from secretariats, government bodies, departments, superintendants and local and state government agencies;
- Representatives from the municipality's council;
- Representatives from the supplier of electricity to the municipality;
- Representatives from the private sector, trade unions and professional associations;
- Representatives from the third sector
- Representatives from teaching and research institutions, as well as technology centers.

The composition of the group reflects strategic considerations. In the case of local authorities, it is important that bodies responsible for the following services are represented in the stakeholder group:

- Water and sewage;
- Administration;
- Housing;
- Urban waste collection;
- Environment;
- Public Works;
- Planning;
- Transportation;
- Other services that are deemed relevant locally.

Stakeholders in Porto Alegre

Porto Alegre Municipal Secretariat for the Environment (SMAM)
ICLEI
Porto Alegre Department of Rain Wastewater (DEP)
Porto Alegre Department of Water and Wastewater (DMAE)
Porto Alegre Municipal Secretariat for Works and Transportation (SMOV/DIP)
Porto Alegre Municipal Secretariat for Administration (SMA)
Porto Alegre Department of Housing (DMHAB)
Porto Alegre Municipal Department for Urban Cleaning (DMLU)
CARRIS (Public Bus Company)
Porto Alegre Municipal Secretariat for Planning (SPM)
Porto Alegre Municipal Secretariat for Health (SMS)
Porto Alegre Municipal Secretariat for Education (SMED)
EPTC (Public Transportation Company)
Porto Alegre Municipal Secretariat for Industry and Commerce (SMIC)
Porto Alegre Municipal Secretariat for Management and Strategic Monitoring (SMGAE)
Porto Alegre Municipal Secretariat for Culture (SMC)
Porto Alegre Municipal Secretariat for Sports (SME)
Porto Alegre Municipal Secretariat for Finances (SMF)
PROCempa (Public Company for IT)
Porto Alegre Municipal Secretariat for Political Coordination and Local Governance (SMGL)
Porto Alegre Council
Tosi (private Company)
SINDUSCON (Trade Union of the Construction Industry)
CREA – RS - Council of Engineers, Architects and Agronomists of Rio Grande do Sul
CEEE (State electricity provider)
Anchieta School
FIERGS (Federation of Industries and Businesses of Rio Grande do Sul)
UFRGS (State Public University)
PUCRS (University)
Municipality of Cachoeirinha
GREENPEACE
SENGE/RS (Labour Union of the Engineers of Rio Grande do Sul)
IDEAAS (NGO)
Biofigia (NGO)
Institute for Municipal Studies (IEM)
Friends of the Earth - Brazilian Nucleus (NGO)

8 Activities to implement the action plan in Porto Alegre

(Indicator 3)

Local Renewables Project Indicator 3:

Proposals of Porto Alegre Reference Center being implemented

Under the project, the third indicator of success involves the proposals of the Reference Center being adopted and implemented by at least two private (or local government) companies in the model community.

In Porto Alegre, many different approaches have been adopted and success has been reached. Through a partnership with the National Program for Rational Use of Oil and Natural Gas – Concept, CRER is advising private transportation companies to adjust vehicles engines so that less fuel is consumed.

Also CRER organized a workshop to inform interested parties how to write proposals to the State Energy Company's energy efficiency fund. As a result several proposals are underway. Specifically, CRER partnered with several parties to write a proposal for the installation of 130 SWHs in a low income housing estate in the city.

Of great impact will be Porto Alegre's agreement with the National Electricity Company, Eletrobrás to change all of the City's public lighting units to led within the next 12 months. CRER will be monitoring and documenting progress.

8.1 The strategic approach: Minha Casa Minha Vida (proposal 1)

My Home My Life (in Portuguese - *Minha Casa Minha Vida* - MCMV) is a federal government housing finance program with the overall objective of providing low-income families with housing while fueling the economy. According to 2008 figures, the habitation union, SECOVI estimates that there is a national housing deficit of 5.6 million. The program was launched in March 2009 amidst the housing crisis that affected the world's most powerful economies. The government foresees an investment of R\$ 34 billion (about € 15,600 billion) that will go towards the construction of one million homes for families that earn no more than R\$ 4,650 (about € 2,130). The program has not reached its initial goal mainly for internal reasons since there were considerable delays in determining regulations. The goal of building 400,000 units by 2009 was not accomplished. Up until 1 March 2010 only 331,000 units had been approved.

CRER staff along with the Secretariat of Environment saw this program as a golden opportunity to change national standards of construction to include sustainable aspects such as solar thermal energy and rain water collectors. Porto Alegre was not the only one to see opportunity in *Minha Casa Minha Vida*. From the beginning the Minister of Environment championed for the inclusion of sustainable criteria in the one million houses that were to be constructed. ICLEI also supported its cities by organizing a series of events in Brasília – the Country's Capital in April 2009 so that they could lobby for the inclusion of sustainable construction criteria. Among them, Porto Alegre representatives spoke of their support for sustainability criteria in the MCMV program. ICLEI and its cities, specifically the Local Renewable Model Communities continuously spoke to the Federal Government and the

financing institution, *Caixa Economica Federal*, pushing for a decision and arguing the benefits of solar energy

Although more details on the Reference Center's operations are in chapter 7, it is worth mentioning here that the involvement of multiple stakeholders in the city's renewable energy work has been one of the most important factors for success. Involving others has enriched the process and brought together resources allowing more to be done. We mention this here since the Center's advisory group was very much involved in Porto Alegre's activities surrounding *Minha Casa Minha Vida*. In one of the earlier meetings when city staff presented their proposal to develop a solar thermal energy policy, the stakeholder group agreed on the importance of also linking their work to push for the inclusion of solar thermal panels in the *Minha Casa Minha Vida* houses, knowing that the city would be greatly impacted by the program.

As a result, several activities were begun:

8.1.1 Research on how MCMV works

In order to best understand what could be done, CRER staff researched how *Minha Casa Minha Vida* was being dealt with in Porto Alegre. The first step was to consult the federal government as well as the Department of Public Works which was the main point of contact with citizens who were registering to participate in MCMV. It was discovered that participants could fall into two different categories depending on their income level. The first group was comprised of families that earn between one and three salaries per month. Currently, one salary in Brazil is equivalent to 510 BRL (€235) – the least a person could earn when legally employed but the 2009 minimum was 465 BRL. For these families, the federal government is responsible for the purchase of the home. For families that earn between four and 10 salaries, they are able to participate in the program but are responsible for the mortgage payments.

8.1.2 Legal Instruments

During the research phase, it was also discovered that the municipality had drawn up a decree to regulate *Minha Casa Minha Vida*. The document follows procedure by establishing certain regulations such as how families will be chosen, selection criteria, documentation required, land use, etc.

At this time ICLEI was working with Betim on the same issue and during a meeting with the head of the Public Works Department in September 2009, it was suggested that the decree be amended to include that all of the MCMV buildings should have solar thermal energy. ICLEI brought this idea to Porto Alegre's CRER but at this time it was still not clear if the federal government would establish that all of the homes should have solar energy since they had not yet published a long awaited internal regulation on the issue. The Local Renewables project cities and ICLEI lobbied the appropriate federal institutions

In late 2009, one of CRER's Advisory Group's members, a Council Member who had been at ICLEI's MCMV event in Brasilia, introduced several amendments to Porto Alegre's *Minha Casa Minha Vida* Law. Two of these measures were approved. One of which was on solar thermal energy which cited the successful use of solar energy in Minas Gerais as a conclusive argument. The Council Member (who is the former Secretary of Environment for Porto Alegre) put forward language forcing all of the buildings to have solar energy in Amendment 4 which was approved on 17 November. However a softer approach substituted Amendment 4's language on 2 December with Sub-amendment 1 now stating that social housing (which MCMV houses fall under) in Porto Alegre are to have solar energy for the purpose of heating water with 'priority'. With priority means that not all units are mandated to have solar water heaters. The Council justifies this decision with technical arguments. For example, it could not be demanded that a building that is shaded throughout the day to install

solar panels. Since all of these buildings are approved by the Public Housing Secretariat, they are in charge of determining if each building should or not have solar thermal energy.

This is a bold move since the inclusion of the equipment makes the building project more expensive either for the construction company and/or for the future homeowners. The building becomes more expensive for the construction company when they are being built for families that earn less than three salaries. In this case there is a limit established by the federal government of how much these houses can cost. As stated before, these homes will be paid by the federal government. If the city is forcing the construction company to include one more piece of equipment, their overall profit margin will diminish, making the homes more expensive for the builders. In the case of homes for families that earn more than three salaries per month, the building becomes more expensive for the future owners who will pay the mortgage over the years.

Since the future homeowner will reap the benefits of solar energy by paying a lower electrical bill in the coming years, it is an easier sell for families who will be paying the mortgage. In the case of homes for families that earn three or less salaries, the sell is not so easy since the construction company will not reap any future savings but will have his profit margin cut. For this reason CRER focused on outreach activities to argue the social, environmental and economic benefits of solar energy.

Another important and very relevant argument used to approve the amendments in Porto Alegre is that past experiences have shown that it is common for low-income families to revert back to inappropriate and illegal living conditions (shantytowns that pose health and safety risks) since they are not able to pay for their utilities. By offering solar thermal energy, the government's social welfare policies become more affective since lower energy bills are able to be paid.

For more information on Betim's MCMV activities, please see the Betim city completion report.

8.1.3 Further Developments

On 31 May 2010, Caixa Economica Federal, the financing agency for *Minha Casa Minha Vida* published its terms of reference for solar energy for MCMV housing for families earning three or less salaries. The document states that solar heaters can be installed in MCMV homes in Brazil's south, southeast and central west regions without any additional cost to the construction company since it would now be added on to the total construction costs to be paid by the federal government. However it does set limits to how much more the inclusion of solar panels can cost.

Although debatable, the north and northeast regions were not included since it was determined that people in these regions do not need heated water for bathing due to the high temperatures year round. The government also states that according to studies it was established that the market would not be ready to supply a greater number of solar panels. Since then 13 thousand requests for homes with solar heaters have been processed and it is foreseen that up to 40 thousand units with solar heaters will be built in the three regions cited above by the end of 2010.

In addition, *Minha Casa Minha Vida II* was launched in the second quarter of 2009. It is expected that 2 million homes – all of which with solar energy- will be built in the second phase which will begin in 2011. The equipment that will be installed is being popularly called the 'flex shower' since it could use solar energy when there has been enough solar radiation to heat water as well as electricity for those not so sunny days. According to the Electric Research Company (Empresa de Pesquisa Elétrica) and the Ministry of Mines and Energy, the installation of the flex showers in the 2 million homes will provide a paramount reduction in GEE savings– equivalent to removing the total electricity consumption of Belo Horizonte

(population 2.5 million), avoiding the emissions of polluting gases in the volume emitted by all of the automobiles in Brasilia which total 220 million tons of emissions per year.

Traditional solar heaters used in Brazil and elsewhere such as the US are connected to boilers that heat large amounts of water when the sun has not been strong enough. The flex showers are more efficient, only heating what is necessary when used. The flex showers cost about R\$ 1,700 (€ 780) per unit. In addition, 266 low-income families will also receive the equipment and a new line of credit for the middle class to acquire the flex shower will be made available. It is estimated that this policy will generate 85 thousand direct and indirect jobs, especially in the construction sector.

8.2 Activities kicked-off and guided by CRER

Listed below are some of the activities that CRER is implementing and/or monitoring:

8.2.1 Bio fuels

Porto Alegre was awarded the Eco-City Prize 2009 by the Brazilian Association of Public Hygiene and Special Waste - (ABRELPE)ⁱ for its work in testing new forms of bio fuel. The pilot project which was developed in partnership with a local academic institution, the Catholic University of Rio Grande do Sul (PUCRS) and the Marist Center for Social Aid (CESMAR), transformed used vegetable oil into a bio fuel that was used to motorize city park vehicles such as tractors and garbage carts. It is estimated that each family in Porto Alegre generates one liter of vegetable oil per month, totaling 400 tons each month. Usually this oil is discarded inappropriately and specialists say that one litter of oil pollutes one million litters of water⁴. For this reason and other problems that used vegetable oil causes, plans to expand the pilot into a full-blown project have been widely discussed.

Currently the Municipal Department for Urban Cleaning (DMLU)ⁱⁱ has established 146 eco-points that serve as vegetable oil collection posts. Four companies collect the oil and two of them transform it into bio fuel. Other companies interested in collection have been in touch with CRER which made the link with the DMLU.

Instead of making the oil available for the private sector to use as biofuel, it wants to use it for its own purposes. The idea is for the City to continue testing which would first provide bio fuel for the City's administration fleet and eventually to the 335 city buses. These buses are already fueled with biodiesel B2 (2% blend of bio fuel to diesel) as required by Federal Law 11.097/05. Thus, the City has reduced CO₂ emissions by 42 tons per month by burning a cleaner fuel. With this measure, Carris, the municipal public transport company is already experimenting with B5 (5% blend of biodiesel) and B10, since according to a new law, a blend of 5% will be compulsory in 2013ⁱⁱⁱ.



Picture 8.2.1: Mario Moncks, Director of DMLU receives Ecocity Prize 2009

4 For more information about this issue and a solution adopted by Volta Redonda, a Local Renewable Model Community, see ICLEI's case study #96.

8.2.2 National Program for Rational Use of Oil, Natural Gas and its Derivatives (CONPET):

The National Program for Rational Use of Oil, Natural Gas and its Derivatives (CONPET) was developed by the Ministry of Mines and Energy in 1991. It is coordinated by governmental and private sector representatives. Its main goal is to motivate the efficient use of non-renewable fuels in the transportation, residential, commercial, industrial, agricultural and cattle raising sectors.

CONPET has established a partnership with CRER-PoA that has rendered some interesting results.

During Environment Week, in June 2010, CRER and CONPET representatives visited freight transportation companies to measure the amount of pollution being emitted by diesel impelled vehicles. Drivers were informed of the results and appropriately advised if their engines should be checked and regulated. Drivers were informed that the engine check would not only reduce the polluting fumes but also reduce the consumption of fuel, thus providing a savings.

CRER and CONPET along with the Municipal Transportation Company (EPTC) plan on partnering up soon to conduct these free of charge measurements to drivers in appropriate street locations.

8.2.3 Implementing an Internal Commission for Energy Management (CIGE) in the Municipal Secretariat for the Environment

Internal Commissions on Energy Management (in Portuguese - *Comissões Internas de Gestão Energética – CIGEs*) are created to implement and monitor energy savings plans within the public administration. Usually one commission is set up per building and is led by a president, preferably an engineer that works in the building. It is also important that the CIGE is made up of maintenance staff who play a large role in the commission's success.

Porto Alegre has had a good amount of success with its CIGEs, inspiring not only other public buildings in the City to create their own commissions but also other cities such as Betim. The CIGE for several public health buildings first developed a survey that they conducted on their electricity consumption in all of the buildings under the responsibility of the Health Secretariat since 2005.

With the results of this study the Commission proposed several projects that aimed to improve energy efficiency and consequently, reduce costs. The Vargas Maternity Hospital is an interesting example of success. The measures included the replacement of 4 elevators, substitution of all air conditioners, replacement of all lamp bulbs, reactors and luminaries, as well as installation of presence sensors and light sensors in the stairs, corridors and toilets. With these measures, in approximately 12 months, there was a 50% reduction in the hospital's electricity consumption.

In September 2009 Betim staff participated in Porto Alegre's first event on renewable energy and energy efficiency. One of the presenters was the president of one of the city's CIGEs in the health sector. Since then Betim has invited the President to speak at their seminar that took place in March 2010 and has also partnered up with their energy provider that organized a basic training on how to create and implement a CIGE. On a local level, the health care CIGEs have influenced the Secretariat of Environment (SMAM) of Porto Alegre to create their own CIGE.

A President and other members including CRER staff who are closely following implementation and progress, have been selected to participate in the Commission and an inventory on the electricity bills of all SMAM units, including parks and squares, has already been carried out. It analyzed the energy consumption for each building over the past 12 months. This inventory has already raised some issues about most of the building's

infrastructure that need to be adjusted. The Commission is scheduled to meet in the last week of July to discuss the inventory and determine next steps.



Picture 8.2.3: Installation of solar water heaters in Porto Alegre

8.2.4 Solar Water Heaters in Porto Alegre

A pilot solar energy project was implemented in Porto Alegre with the financial support of the Local Renewables Project. In 2009 CRER staff began a market analysis of solar water heaters. The purpose was to install solar energy in a public building that could serve as an example of sustainable energy. CRER staff chose the central public area unit in the center of the City. The building serves as a base for over 20 workers that are in charge of keeping the grounds of the city's many parks in that region of the City. As a result, on Environment Week 2010, 10 June, the project was officially inaugurated.

In total 10 solar water heaters were installed which will allow workers hot showers by heating 600 liters of water. CRER has been on location on a weekly basis to provide guidance to users and monitor results which will be posted in a public entrance of the building. The experience has been very successful in teaching CRER staff more about the technology and providing practical experience. For example, it has already been noted that some of the trees in the area will need to be slightly pruned to allow the panels to absorb more solar rays.



Picture 8.2.4: Inauguration of solar water heater Project in Porto Alegre, Credit to Pedro Revillon, PMPA

8.2.5 Project proposal training

According to Brazilian Federal Law No. 9.991/2000, all electricity providers must invest 1% of their net revenue on two funds. Half a percent is spent on energy efficiency and the other half on research and development. The funds invested on energy efficiency combat

electricity waste within the framework of the national Energy Efficiency Program (*Programa de Eficiência Energética*, PEE). It is through PEE that Betim partnered with Minas Gerais Energy Company (CEMIG) to implement several projects that provided solar water heaters to 1356 low-income families between 2004 and 2007.

Following Betim's footsteps, Porto Alegre's CRER began with a very positive interaction with their energy provider, the State Company of Electric Energy (in Portuguese - *Companhia Estadual de Energia Elétrica* – CEEE). The company is an active member of the Center's Advisory Group and through this forum, the CEEE representative informed of the scarcity of projects proposals that they receive applying to the energy efficiency fund. When asked why this is, the representative informed that people do not know of the fund's existence and that many do not know how to go about writing a proper proposal. As a result of this discussion CRER invited the representative to conduct a training session on how to write proposals for the fund. The training, "CEEE Workshop: The Energy Efficiency Program" was conducted on 9 March 2010 with the participation of over 70 participants.

At the end of the workshop, time was set aside for debate. During this period, participants were proactive in determining future projects while others share experiences of having written proposals that were approved by the fund. As a result the CEEE representative decided that a more extensive training session which would be composed of several practical activities should be organized between CEEE and CRER.



Picture 8.2.5: CEEE Workshop

8.2.6 Solar energy for low-income families

Another positive result of the CEEE training (see previous point) was that a group of participants present decided to work together on a proposal to be submitted to CEEE.

It was discovered that for some time the Housing Department had wanted to submit a proposal to CEEE to request solar thermal energy panels for a low-income housing complex. They had been impeded by not having people on staff that knew how to design such a proposal and lack of funds to hire someone to develop one. Having uncovered this information in the debate, CRER, the Housing Department and a City Councilman (the former Secretary of Environment) who takes part in CRER's Advisory Group met to see what could be done together. The exchange was very fruitful and a solution was found.

It was decided that CRER would hire a consultant through their environmental licensing fund to design the project that would be coordinated by the housing department. The Councilman supported the initiative by speaking to the Head of the Housing Department (a personal contact). A proposal for the implementation of solar water heaters in 130 low income housing units in the Housing Estate 'Pôr do Sol', was handed to CEEE on 14 July 2010 and is

awaiting approval by the National Energy Agency (ANEEL). If approved, the project shall be implemented by CEEE.

As a result of the contact made by the Councilman to the Head of Housing, the initiative took a leap greater than one housing estate! Center Advisory Group members led by the Councilman are discussing with the Housing Department, CEEE and *Caixa Econômica Federal* (CEF) - financing institution, the creation of a Sustainable Action Forum for Social Housing which would act to promote sustainable construction.



Picture 8.2.6: The Network in Action – Betim's success with solar energy in the housing depicted in photo motivates Porto Alegre to do the same

8.2.7 Energia em Debate

Among the many lessons that the youngest of the Model Communities learned from their more experienced Network members is the importance of knowledge sharing. In Porto Alegre this was done in a very similar way to what is done in Betim. Partnering up with other institutions, CRER developed Energy in Debate (in Portuguese – *Energia em Debate*) a debate series on renewable energy and energy efficiency issues which aims to enhance public debate with experts. A debate is scheduled to occur once every quarter. In 2010 two have already taken place. The first focused on solar energy and brought together over 60 participants on 30 March. The later dealt with wind energy on 10 June. It is not surprising that the wind energy debate attracted 140 participants since Rio Grande do Sul has great potential for wind energy and one of the biggest wind farms in Brazil is located in the *Gaúcho* State. The idea for this particular topic was sparked by several conversations with representatives from the City's biodiversity department concerned with wild life death due to wind turbines. This conversation began in September 2009 when CRER invited experts to speak on state of the art of wind energy. Following ICLEI collected several studies from the international network that were shared with Porto Alegre. During the Energia em Debate, speakers spoke of this problem and offered possible solutions.



Picture 8.2.7a: One of the country's biggest wind farm in Osório, Rio Grande do Sul



Picture 8.2.7b: Energia em Debate, March 30, 2010

8.2.8 Sustainable Energy Education in Public Schools

Inspired by the work that fellow Indian Model Community Bubeneshwar has done with school aged children, Porto Alegre has partnered with the Environmental Education Department to develop sessions on sustainable energy. Colleagues from environmental education already have a long history of work experience with school children. They receive many requests from teachers who need to include environmental education in their study plan in one form or the other as mandated by federal law. However up until this point Porto Alegre had not focused on teaching RE and EE to children. This has already been done by including the issue in the materials that are distributed during their activities. Currently a new schedule of school visits is being developed and energy issues will automatically enter into the agenda.

In addition to this CRER is also exploring the idea of developing RE and EE projects with children and their teachers. This was an idea that came about since it is perceived that a good number of teachers do not implement what is taught in the environmental curriculum. CRER is interested in developing longer term projects that could be monitored in the schools over time which would serve as a more practical educational experience. For example, organizing competitions among schools that are able to save more energy or monitor an energy efficiency measure that has been implemented.



Picture 8.2.8: Teco Sabiá, the character that symbolizes air and energy issues in environmental education materials for school children

8.2.9 Workshop “Introduction to Solar Heating Systems for Professionals”

SMAM has supported Studio Equinócio and Institute Ekos in the organization of a workshop to be held in July to teach architects and engineers how to develop solar water heaters projects. This workshop, a part of a series that is travelling the Country, is sponsored by the GTZ. This workshop is of extreme importance in Porto Alegre for several reasons. When ICLEI and Porto Alegre were researching companies to install SWHs in the public building as a demonstration project (see above), it was difficult to receive a timely response, in some cases close to a month. One of the reasons given is that these companies are working with a great demand of requests and that there are not enough people available in the field. Also, according to the Brazilian Association of Refrigeration, Air Conditioning, Ventilation and Heating (ABRAVA) that was founded in 1968, they have very few associates in the South of the Country and they have received a few complaints about inadequate installations of SWHs in Porto Alegre. With the policy work that is underway the demand for well trained professionals will increase and if the market cannot meet the demand there will be a backlash to veto or reverse legislation that mandates SWHs.

8.2.10 Generation and use of Wind Power in a SMAM Conservation Unit, Morro do Osso

CRER is supporting a project headed by the Group for Development of Renewable Energy (GDER) from the Federal Public University of Rio Grande do Sul (UFRGS) to deploy a small wind turbine (0.075 MW) to generate electricity with the objective to power the headquarters of the Conservation Unit. Initially, the energy generated will supply only a portion of the electricity consumed by the headquarters but further expansion will be possible after the testing that will be done upon installation.

8.2.11 Efficient Lighting

Porto Alegre had 100% of its public lightings units substituted to use led. This represents an energy savings of 85%. Traditional bulbs have a lifespan of about 6 months whereas leds' duration is of about 3-4 years. Out of 21.042 bulbs 4 thousand had to be changed on a monthly basis. Through an MoU with Electrobrás, all of the lights will be changed within the next 12 months. CRER will be monitoring and documenting progress.

9 Cooperation and partnerships: building local, national and global relationships

(Indicator 4)

Local Renewables Project Indicator 4:

Integration of Porto Alegre into an international network of local authorities

Under the project, the fourth indicator of success involves the integration of the model community into an international network of local authorities.

In Porto Alegre, this indicator was fulfilled by several activities that took place during the project. The city's leadership and technocrats participated in several events and training workshops where other cities from the Local Renewables project were present and the exchange of experiences was extremely rich, influencing the city in areas such as climate change. Porto Alegre was able to learn about how the other Reference Centers in India operate and as a result adopted some of their measures. Porto Alegre not only visited other cities but was visited by others that came to learn.

Being an ICLEI member, Porto Alegre participates in ICLEI's global network where city representatives were also exposed to what is happening on a global level. Of great relevance, Porto Alegre's Secretary of Environment and a group of legislators participated in the UN's climate talks in Copenhagen in December 2009 with the objective of influencing the Brazilian Government to take appropriate measures to combat climate change.

Also worth mentioning is that Porto Alegre is committed to being a part of the international community, having set an specific department in the Municipality to promote international relations and having a long standing experience serving as model for other local governments around the world, notably on the subject of participatory budget.

9.1 Seminars organized in Porto Alegre



Picture 9.1a: National Seminar on Municipal Sustainable Management, March 2008

Porto Alegre was officially launched as a Model Community during the National Seminar on Municipal Sustainable Management (in Portuguese - *Seminário Nacional de Gestão Sustentável nos Municípios*) that took place between 26-28 **March 2008**. The event took place at the university – PUC-RS and united 650 participants when initially organizers thought that 250 would be the maximum of interest that they would attract. During this event – the

first of its kind in Porto Alegre the Local Renewables Model Communities came together in a workshop organized by ICLEI to discuss their progress thus far and next steps that each would be taking in regards to their RE and EE agenda. Porto Alegre was announced as the Country's 2nd Model Community and a discussion about the City's challenges and expectations took place.



Picture 9.1b: 1st Seminar on RE& EE in Porto Alegre, September 2009

In **September 2009**, CRER and ICLEI Brasil co-organized the 1st Seminar on Renewable Energy and Energy Efficiency in Porto Alegre at the Regional Council of Engineers, Architects and Agronomists (in Portuguese - *Conselho Regional de Engenheiros, Arquitetos e Agronomos - CREA*), bringing together over 100 people including others from neighboring countries. Along side the main event, ICLEI organized a series of workshops, one of which was a closed-door event for Network members. During this time ICLEI implemented a group activity to foster knowledge sharing among the cities and also discussed ideas on how to better integration among each other.



Picture 9.1c: Local Renewables Network Workshop in Porto Alegre, September 2009

9.2 Global cooperation and partnerships

The city of Porto Alegre has been an active participant of the Local Renewable Network project. High level city officials have attended project meetings, capacity-building programs and technical visits in Brazil and abroad. Several representatives took part in events in Freiburg (Germany), also a Local Renewables project partner city, and visited the local soccer stadium that is powered by photovoltaic energy.



Picture 9.2: Local Renewables representatives at RE event in Freiburg (Germany), April 2009

Porto Alegre is equally very open to strengthening its relations with other local governments and international organizations abroad in order to continue to learn and develop new renewable energy and energy efficiency policies. As mentioned in the beginning, Porto Alegre is an important center of activities for the Mercosul bloc in Brazil and its global influence can cause an impact in neighbouring countries.

It is interesting to mention here that Porto Alegre was chosen in 2010 to participate in the “Promoting Local Biogas Use for Sustainable Development in Brazil” project which is being implemented by ICLEI-Brazil with financial support from the Renewable Energy and Energy Efficiency Partnership (REEEP). The main goal of this project is to improve urban sanitation and increase clean energy generation through methane recovery technology. One of the main reasons why Porto Alegre was selected was its previous work on renewable energy issues.

9.3 State and national level cooperation and partnerships

As stated previously, relevant parties see CRER – Porto Alegre very positively, attributing great importance to its role of connecting people and institutions together. Just as importantly, CRER has assumed this role consciously with much ease and pride. This is already being done, even in its short life as a Model Community, via the solar energy project in a low-income housing complex in partnership with CEEE and the Housing Department.

Other cities from the metropolitan area such as Canoas participate in the Advisory Group and as the State Capital, Porto Alegre has great potential to influence other cities to implement similar actions. For example, Santa Maria, one of ICLEI’s newest members located in the middle of the Rio Grande do Sul state has become interested in RE and EE through Porto Alegre. Sooner or later, cities do not want to be left out and excuses to not develop innovative policy run out.

As the second Model Community, Porto Alegre has greatly benefited from the lessons learned by Betim and the other Indian cities. The cities have exchanged information on how to set up the reference center and other issues including how to best reach target audiences and monitor their activities. Several in person meetings have taken place, mostly with the guidance of ICLEI staff.

Betim has also been highly influenced by the Local Renewables Network cities. For example, Porto Alegre plans on replicating São Paulo’s solar energy policy. They have been closely in touch with São Paulo’s staff who have gladly shared information and lessons learned. Also, Porto Alegre and Betim have exchanged information on this policy since both were developing their city legislation at the same time.

Through project documentation and personal contacts, other types of exchanges have also taken place. For instance, Porto Alegre and other cities have learned about Volta Redonda's successful experience in implementing a vegetable oil recycling program through a case study that was written on this initiative. (see ICLEI case study 106 for more details) Betim, Porto Alegre and Belo Horizonte have worked on similar initiatives in the past few years. For example, Belo Horizonte is currently developing a vegetable oil recycling program using a regulatory instrument whereas Porto Alegre and Betim are consulting local businesses on how to develop solutions to the issue while adding value such as job creation and capacity building programs. Although these cities were not solely influenced by Volta Redonda's experience the exchange among them gave them confidence, ideas and lessons learned as they moved forward.



Picture 9.3: Members of the Local Renewables Network in Porto Alegre, 2009

An important aspect of the project has been a **friendly competition** among project cities. ICLEI's ability to bring to the discussion what other local governments are doing instigates the cities to push forward instead of just celebrating their current victories. For example, Belo Horizonte officially launched its GHG emissions inventory in December 2009 and the Secretary of Environment discussed the process and results at COP 15 in Copenhagen with many including other Secretaries of Environment present from Brazilian cities. As a result, many of these cities, including Betim and Porto Alegre met with ICLEI about how to go about developing their own emissions inventories.

Network cities have met with ICLEI to discuss how to better communicate among them. So far, interaction between the cities is **made mostly through ICLEI** when the organization sees an opportunity to share experiences. Some initiatives have been implemented such as a city-only list-serve and person-to-person exchanges but there is still much to improve. An idea yet to be implemented is a routine meeting (even if by telephone for budgetary reasons and to reduce emissions) between at least the Model Communities of Betim and Porto Alegre. Such meetings would provide an open space for staff members to learn about what each other is doing, identify opportunities and discuss challenges. All have also agreed that there is much expertise among them that could benefit each other and that at least the Model Communities should invest in bringing Local Renewables project city staff to present specific issues in their respective debate series.

One barrier is that Brazil is a Country of **continental proportions**. Travel among them must be done by air (except for Betim and Belo Horizonte which are an hour's drive from each other) since no other possible means of transportation is available.

Another very relevant complication on the global scale is the **language barrier** that Brazilian cities face when trying to communicate with other Network cities. Since in most cases, English is used as the working language and interpretation/translation is not always offered, Brazilian cities are left out of the loop. Being that often other barriers such as differences in culture and jet leg present challenges, it becomes even more trying to communicate in a non-

familiar language. This has presented budgetary challenges for ICLEI that tries to overcome these issues by hiring interpreters.

The problem does not end with person-to-person engagements. As stated at the beginning, one of the Local Renewable goals is to promote the use of renewable energy and energy efficiency. This is done not only at speaking engagements but also in written form. Thus the project in Brazil has taken on a financial burden of not only **translating** relevant information into Portuguese for lusophones but also committing to provide information to others in other languages, most times in English. Since information needs to be translated, most times Brazilian work plans schedule time for translation and additional editing which add costs since either staff are doing these activities or it is contracted.

Given this difficulty, unfortunately there has been **little communication between Brazilian** cities and the other Network cities outside the country. Although common interests have been identified across the Atlantic and Indian Oceans, a lack of resources has not allowed a deeper connection. There have been several virtual and in person meetings over the years that have been brokered by ICLEI with interpretation support.

Model Communities in Brazil have also learned about what is taking place in the reference centers in India and have implemented some of their best practices and were thoroughly inspired by their Indian counterparts. Many more of these exchanges could take place with the objective of inspiring each other to go beyond their current achievements.

This is particularly correct for India and Brazil, both BRIC countries with growing economies that suffer from brutal inequality among classes, share similar climates and can set a new benchmark for sustainability for developing countries.

It is also worth mentioning that the inclusion of South African cities is very much welcomed since Brazil also shares many similarities with the African Nation, even more so now that both will have the recent experience of hosting the World Cup.

10 Impacts and legacies of the project in Porto Alegre

Porto Alegre as a Model Community in the Local Renewables projects has project legacies on a local, national and global level. The most relevant are listed below.

10.1 Local impacts

- **Better understanding of opportunities and challenges:** The first study on existing opportunities and challenges to be overcome locally, regionally and nationally enabled the city to easily identify 'low-hanging' fruits that were ready to be reaped and make them aware of challenges and present recommendations on how to deal with them. The value of this study has been that both Brazilian Model Communities have decided to update it, at least once every two years. Subsequent updating will allow them to gauge impacts of the various interventions. The preparation of the study has enabled Porto Alegre to set priorities for actions.
- **Monitoring of results:** One of the most important impacts, if not the most important is breaking the culture of not monitoring results and basing future action on assumptions. Monitoring may be said to not be a part of Brazilian culture, especially in local governments that work with stretched resources. This was specifically difficult in the early phases since proper monitoring must be planned for before actions are implemented rather than at the beginning of the monitoring phase. But when CRER staff began to see the importance of information obtained in monitoring, either to help them in designing future action or to lobby for support from leadership and external parties, they began to adopt it in their work plan.
- **Selection as a Model Community:** Porto Alegre was the second city selected to participate in the Local Renewables project. Such a selection process adds value to the title on a national level and it would be seen in a positive light if a city would continue the projects it began as a Model Community. The main impact of this is the further strengthening of the city's commitment to RE-EE policies and projects.
- **The Porto Alegre Resource Center has evolved into a competence center for RE and EE within the city government.** CRER is one of the most visible impacts of the Local Renewables project in Porto Alegre. The Center has been supported and encouraged in its activities since project inception and its role and importance within the city has grown over the project. The Center and its staff are now involved in various energy related matters and proposals within the city such as Municipal Energy Management Plan (PLAMGE), providing ideas and advice as well as establishing policy, not restricted to only activities under the Local Renewables project. The awareness programs undertaken by the Reference Center have had widespread impacts throughout the city.
- **Increase in local business in RE and EE:** Although it is too early to prove, it is safe to assume that CRER is slowly starting to influence local businesses. This is being done by their work on expanding the CIGEs, solar thermal projects which are investing in green technology and technical staff with skills as well as its outreach activities and training programs that are making people aware of funds available to foster green technology and energy efficiency measures.
- **Scaling up:** The project has expanded Porto Alegre's experience of the installation of solar thermal energy. Being a Model Community influenced Porto Alegre to take these steps. Their policy-work which is reviving dormant laws that can surely influence the market, creating an increasing demand of SWHs and other technologies as well as the development of new laws is going to scale up. Another more recent activity in the field of

energy efficiency via the Internal Commissions on Energy Management (CIGEs) is based on the strategy that CRER will first install the commission in their building. When measurable successes have been reached, the initiative will be spread to other buildings such as schools and hospitals through a mayoral decree.

10.2 State level and national impacts

- Local governments are confirmed as relevant actors: National and state level officials were consistently involved in the project activities in Porto Alegre through inclusion in the stakeholder group, events, projects and others. This allowed Porto Alegre and CRER in particular to be advised by state and national expertise such as CEEE – the energy provider, while also serving as a role model for implementation of the various measures.
- On a national level, several ministries (for example, Ministries of Mines, Energy and Environment) are made aware of the key roles of local governments through meetings, project reports and joint sessions. This is particularly true due to ICLEI's work with cities on the Local Roadmap Project that worked with cities across the world to influence national governments' decision and actions in regards to emission reduction goals.

10.3 Global impacts

- **Increasing realization in the world about RE and EE initiatives in Brazil:** ICLEI has helped to coordinate events and sessions highlighting local renewables at various international platforms. Porto Alegre has been represented at a number of these occasions and has had the opportunity of sharing their experiences, progress and impacts. Cities from around the world have been able to gain from Porto Alegre's information sharing.
- **Potential expansion of the Local Renewables network:** Other cities in Brazil and Uruguay have expressed interest in pursuing a similar Local Renewables initiative.

10.4 Turning the legacies into new projects

Given the success of the Local Renewables project in Brazil and the opportunity to build on existing efforts, success, commitments and people, ICLEI has been sought after for several other project ideas by its member cities.

10.4.1 Expansion of the Network in Brazil:

Since the project began in 2005 ICLEI has been asked to expand the Network to other cities in Brazil and other countries in the region. Although the proposal to become bigger was tempting, we thought it wise to establish a strong base, working within limits in order to grow in a more structured manner in the future. The decision to choose the second Model Community from within the cities that participated in the Network was done along this frame of mind. Now that we have worked with these cities for the past five years, learning from our success stories as well as from our mistakes, it is time to expand the Network.

Strategic framework: In Brazil, this is especially important since **Minha Casa, Minha Vida** is providing a national framework to justify the use of renewable energy. ICLEI has built a strong network of partners from all sectors including banks, research institutions and federal government institutions to further expand. Expanding the Network within Brazil is needed at this point.

Other regions in Brazil: Progress and excitement about renewables is being spread in the south and southeast of the country via Porto Alegre and Betim. It is now the time to do the same in other regions. We believe that there is momentum now because through its work on climate change with states, ICLEI has developed a working relationship with the city of

Manaus in the state of Amazonas which took a leading role in organizing a movement of cities from the Amazonian region to participate in COP 15. Manaus, whose energy matrix is made up of diesel and oil to produce electricity, has shown interest in participating in the Network as a Model Community.

10.4.2. Using the World Cup

Other cities such as Rio de Janeiro have also shown interest. This momentum is also being created by Brazilian cities' race to be showcased as sustainable cities by the World Cup in 2014. Many of these cities' environmental departments do not have experience or information on renewable energy. Now with two solid cases of success, ICLEI is ready to expand the Network to further inspire others to act. In addition to expanding the Network under the spirit of the World Cup, ICLEI also sees a very viable opportunity to bring sustainability to the forefront of the host cities' agendas using the sporting event as a catalyst. The Brazilian Government has determined several priorities for the global event which includes waste management, energy efficiency, and water management. ICLEI is developing a proposal to establish sister-city partnerships between Brazilian hosts and German as well as South African cities that hosted the event in 2006 and 2010.

10.4.3. Spreading to the region

In regards to Latin America, ICLEI also sees opportunities for successful Model Communities in further countries. Spreading the Local Renewables Network to the region can make good use of the work that has already been laid by ICLEI in other projects. Specifically speaking about Montevideo and Buenos Aires, these cities are currently participating in an ICLEI project that promotes the development of sustainable construction policies. Both have been working on solar energy. Cities in Uruguay for example have to regulate the solar energy law created by the federal government in 2009. Montevideo has developed a renewable energy group that is working on the regulation as well as other construction policies that involve energy efficiency measures. The city has also been experimenting with wind energy as a result of a partnership with an energy provider. Unlike Brazil, the use of alternative sources of energy is in dire need since the country imports all of its energy, meaning that consumers pay a high price. Since many only react when they are financially affected, Uruguayan cities and citizens are very open to renewables.

Another important factor about working with Montevideo is that, as a national capital city where a third of the country's population lives, it acts as a strong influence over other cities. We have seen this through the sustainable construction project, as two other cities in the metropolitan region also developed their greenhouse gas emissions inventory as Montevideo was completing its study. Welcoming Montevideo into the Network would also be interesting since it could easily exchange experiences with nearby Porto Alegre. Both cities have a history of working together in the Mercosul economic block in regards to issues that affect the southern cone of the continent. It will also be of great importance to have a Spanish-speaking city in the Network, which will create the need to publish information in Spanish which can be better disseminated to other Latin American countries.

10.4.4. Research and project development on cooling issues

Questioning the need for cooling and starting a debate to alternative technologies

Traditionally, artificial cooling has not been used in Brazilian residences. Mostly, air conditioners are used in office buildings that have been built on modern-looking buildings that unfortunately are not sustainable in tropical climates. But more and more we are becoming aware of an increase in the use of artificial cooling systems due to higher temperatures. Air conditioners have also become more popular since their prices have dropped. ICLEI sees here the need to develop a research project on artificial cooling. The results of such a study would point to usage tendencies and its risks which would allow the development of recommendations and future projects on sustainable construction and natural cooling options.

The City also has several plans in the pipeline that will further promote the cause of local renewables in Porto Alegre.

10.5 A legacy for continuation in Porto Alegre

GHG Emissions Inventory: Another priority for Porto Alegre will be the update of their emissions inventory. Porto Alegre is also in touch with ICLEI about this issue. The involvement of these cities in ICLEI's Local Roadmap project has created interest in cities to take their baseline inventories seriously especially now that many cities are doing it.

Setting reduction goals: Once Porto Alegre has its updated GHG inventory, it will be able to establish reduction methods not only in emissions but set a sub goal of energy reduction via policy. This will further build internal capacity within Porto Alegre's technical body and allow it to participate more actively in national and international debates on the issue, which in turn allows local governments a stronger voice and influence.

Policy work: Porto Alegre continues to work on the solar energy policies mentioned earlier in order to guarantee that the city goes further. This action is also important beyond the city's borders since it is in line with the national government's energy efficiency plan to reduce emissions as presented at the United Nations Conference of the Parties in Denmark (COP 15) in December 2009.

Other projects: In addition, Porto Alegre will continue to work on activities present on the Impacts Chart, including the set up of an Internal Commission on Energy Management (CIGE) in the SMAM building, further negotiations for the development of a city-wide recycling program of used vegetable oil to be turned into bio fuel for the City, a training program for architects and engineers on how to include solar thermal panels in architectural projects, the mobilization of real estate companies, permanent rounds of debate on energy consumption "Energia em Debate", monitoring activities, and offering technical help.

11 Lessons learned and recommendations

These are the lessons learned over the course of the project, and recommendations which can be made based on the experiences in Porto Alegre. This information is based on extensive literary research and surveys of key stakeholders in Brazil.

11.1 Educational aspects

Lessons learned

- Not enough actions have been carried to raise awareness on the importance of RE and EE in all segments of society
- There is insufficient disclosure of the economic and financial benefits of RE and EE.
- Most of the professionals acting in architecture and engineering were not educated on the concepts of sustainable construction, RE and EE throughout University, which makes difficult for them to use these in current projects.

Recommendations

- Promoting education, training and sustainable energy consumption in different segments of society is necessary.
- It is important to encourage the exchange of information on energy efficiency and renewables, as well as measures of control and reduction of GHG emissions among the various economic activity sectors.
- Data available on financial savings from the installation of solar water heaters in low-income housing, as the ones from Betim for example, could be disseminated in all segments of society.
- To make project-demonstration feasible, partnerships could be made with organizations such as CEEE.
- It would be interesting to explore the possibility of having a model building in the use of RE, EE and other aspects of sustainable construction (use of rainwater, etc.) as a headquarter for CRER.
- Investing in the CRER website as a means of disseminating best practices in RE / EE from the city and other parts of Brazil and the world.

11.2 Financial and economic aspects

Lessons learned

- Many respondents consider the investment required for use of solar energy, both thermal and photovoltaic, as well as other types of ER, too high.
- Credit available for RE is not available.
- The Building sector follows a market logic which prioritizes economic credit instead of sustainability in its social environmental aspect.
- The private sector has a short-term view of their investments. For RE, for example, return on investment is not immediate, but has proven advantages on medium term.
- There are no financing mechanisms available for EE projects.

- Knowledge on the economic and financial benefits of energy efficiency and RE is still limited.

Recommendations

- CRER has worked close with CEEE, to facilitate various projects and actions in Porto Alegre.
- Greater disclosure is needed on the economic advantages of especially of solar water heaters, but also of the use of other renewable sources, throughout all segments of society.

11.3 Legal aspects

Lessons learned

- The Building Code of the city is outdated. It has not been reviewed since 1992, and does not address environmental aspects or RE / EE. In 2007, a Working Group was established to review the Code, but did not make progress and ceased after some time.
- The matter of sustainable construction is directly related to EE, and there is no regulation to that effect in the municipality.
- In Porto Alegre, there is no measure in place to encourage sustainable procurement.
- There is no regulation or incentive to retrofit in old buildings with outdated systems that consume an excessive amount of energy.
- Environmental licensing does not hold criteria on RE / EE.
- The law for mandatory use of solar water heaters have to be thought of within context of the building code, since a building may emerge next to a house with solar heater and compromise their access to sunlight.

Recommendations

- Review of the Building Code of the city, emphasizing the reduction of energy consumption and promotion of use of alternative energy sources such as solar energy for water heating in new buildings; parameters for more sustainable construction, among others.
- The feasibility of including criteria for RE / EE in environmental licensing could be further studied. Since CRER falls within the structure of SMAM, the initiative may be facilitated.
- Laws need to be well regulated, and it is important to have the collaboration of field specialists in order to avoid inconsistencies. In the case of regulation of law to encourage use of solar water heaters, for example, is necessary to consider that the incentive shall not be granted in cases where the consumption of solar energy is not adequate.
- Another regulation suggested by some of the stakeholders is the compulsory installation of structure for solar thermal energy in new buildings. The advantage of this measure is that it does not charge the construction and latter allows the installation of equipment at a lower cost, if compared to a building without such preparation.
- For the law on mandatory use of solar heating, the experiences of Barcelona, Spain and São Paulo can be explored.

11.4 Political and structural aspects

Lessons learned

- Lack of internal communication between Departments of the Municipality in order to articulate actions.
- Lack of Guidelines for the promotion of EE in public buildings. Lack of a municipal energy policy.
- Just as in all other levels of government, bureaucratic processes at the municipal level are always quoted as barriers to developing and following through on actions.
- Lack of a closer relationship between the government and private sector.

Recommendations

- Study of the feasibility of an Energy Efficiency Law for public buildings in the city. The experience of Buenos Aires can be explored.
- Promote Energy Efficiency Programs in commercial, private and residential buildings.
- Establishment of a program to foster energy efficiency.
- Promote the reduction of energy consumption during peak hours, avoiding the need for new power plants.
- The feasibility of an incentive or benefit in environmental licensing to industries that use some type of renewable energy or that have an internal program of energy efficiency should be further considered.

11.5 Technological aspects

Lessons learned

- Technology sources for most types of RE is foreign, and its costs are high.
- Lack of knowledge of currently available technology by players involved.
- Lack of specialized work force

Recommendations

- Technologies in RE and EE need to be further disseminated. Better dialogue solutions are needed between different segments of society, allowing the exchange of information and experiences.
- CRER could contact municipalities that have successfully implemented technologies and exchange experiences. CRER can also keep in touch with India, for example, and bring experience and success stories here.

Further Recommendations

- Solar thermal energy can be installed in rural areas.
- CRER can work with DEMHAB and CEEE to enable the installation of solar water heaters in Mato Grande Sampaio. DEMHAB showed interest in receiving support from CRER.
- The proposed participation of CRER in Federation of Industries and Businesses of Rio Grande do Sul (FIERGS Group) on Energy within Agenda 2020 should contribute to the debate, and give visibility to the Centre.

12 Documents, events and publications

The following documents are available from the ICLEI LACS Secretariat.

Contact: [rede.elo@iclei.org](mailto:redes.elo@iclei.org)

Documents

- Opportunities, Challenges and Recommendations on Renewable Energy and Energy Efficiency for Porto Alegre (Portuguese)
- Law 560, which establishes the Program on Incentives to the Use of Solar Energy in Buildings (Portuguese)
- Law 10.320, which creates the Municipal Program on Prevention, Reduction and Compensation of CO2 Emissions and other Vehicular GHGs and provides for the installment of the Municipal Fund for Reduction of CO2 and other Vehicular GHGs (Portuguese)
- Law 15.418, that encourages the installation of solar panels as compensation for land use (Portuguese)
- Manual for the Capture of Biogas; Volume1 - Landfills (Portuguese)
- Local Renewables Project, Betim City Completion Report

List of events where Porto Alegre participated

Seminar “Energy Efficiency and Renewable Energy in Brazilian Cities”, 23 and 24 September 2009.

“ I International Journey on Renewable Energy, Energy Efficiency and Local Government in Betim: Technological Innovation for a New Economy”, 17 – 19 March 2010.

Case studies

- ICLEI case study 113: Stakeholder involvement groups for Local Renewables in Betim and Porto Alegre
- ICLEI case study 112: Solar heaters in low income housing estates: Energy and financial savings in Betim
- ICLEI Case Study 106: Cooking oil waste is used in community development with the Eco-oil Programme

i http://www.abrelpe.org.br/premio_ecocidade.php

ii http://www2.portoalegre.rs.gov.br/dmlu/default.php?p_secao=94

iii <http://www.carris.com.br>; <http://www.eptcb.com.br>

The Local Renewables Model Communities Network

The Local Renewables Model Communities Network (or Local Renewables project) is a key component of ICLEI's Local Renewables Initiative. This international project connects leading cities in order to cooperate in sharing their expertise and experience in the fields of renewable energy (RE) and energy efficiency (EE).

Special support for participating model communities in India and Brazil was possible due to generous funding from the German Federal Ministry for Economic Cooperation and Development (BMZ) through the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH. Model communities within the Local Renewables project are supported to develop exemplary practices in the field of sustainable energy, with the goal to also inform and encourage other local governments to follow their example.

Project activities with model communities include:

- compiling energy status, energy audit and carbon emissions profiles;
- researching urban renewable energy potential;
- developing local policies for RE and EE and adopting these policies in the municipal council;
- establishing and operating RE and EE Resource Centers as places to learn, to showcase practical RE and EE applications and to provide technical expertise; and
- involving stakeholders throughout the process.

Within the Local Renewables project three types of cities were connected:

(a) Model Communities: Cities or towns that have declared their intention of becoming model communities and have made a formal commitment to local renewable energy strategies.

(b) Resource Cities: Cities or towns that are ready to share their expertise and experience with other cities in the Network and beyond. Resource communities have highly developed renewable energy and energy efficiency strategies, with effective actions implemented.

(c) Satellite Cities: Cities or towns that have an interest in learning with the Network and contribute when possible.

The Local Renewables project has enabled cooperation between cities in Brazil, India, Europe and South Africa.

