

## **Luca Annesi - Summary**

The research project starts from the collaboration between the University of Bologna (Italy), in which I enrolled as a graduate student, and the University of Saskatchewan (Canada), where I spent a Research and Exchange (R&E) period, as both the mentioned Universities are members of Rural Policy Learning Commons (RPLC) network. The exchange period took place thanks to the R&E grant from RPLC, co-financed by a scholarship for thesis abroad granted by the University of Bologna. From September to December 2017, I was hosted in the School of Environment and Sustainability (SENS), located within the University of Saskatchewan campus in Saskatoon (Saskatchewan, Canada), under the supervision of Dr. Philip Loring.

My research was concerned with renewable energies and specifically my thesis title was “*Renewable energy development in rural areas: barriers and opportunities for policy interventions in Canada and Italy*”.

Renewable energy sector has seen rapid growth over the last decade, mainly due to incentives aimed at decarbonizing energy production and revitalizing rural areas. However, its sustainability has been increasingly questioned, in both academic and political debate. The development of renewable energy systems represent an important opportunity for people living in rural areas and could represent an enormous benefit for their communities and the broader society. For this reason, a sustainable development and management of innovative place-appropriate energy solutions are crucial for rural areas. However, without the right policies, the sustainability of rural communities could be limited by situations of trade-offs between the social, economic and environmental dimensions, such as energy security, job creation and climate change mitigation. The purpose of my research was to generate a clear framework about policy instruments and the governmental initiatives in force today, aimed at the development of renewable energy supply chains. Since the study intended to analyse policy issues related to renewable energy systems, it has been discussed how the policies and regulatory structures are constraining or facilitating the deployment of bioenergy projects in two case studies: in Emilia Romagna (Italy) and Saskatchewan (Canada).

Starting from the review of literature, the linkage between renewable energy systems development and the sustainability of rural areas has been studied. For each of the two countries, the most relevant stakeholders in bioenergy sector have been identified. Moreover, the political and institutional frameworks, energy markets, renewables targets and policy instruments at different governance levels of the two case studies have been described and compared each other.

The R&E period abroad has allowed me to better understand the dynamics of political decisions outside my country and study closely what political instruments and initiatives are in force in Canada to encourage the diffusion of renewables on a small and large scale.

During that period, the participation at important conferences was a great opportunity of fundamental importance in order to obtain specific informations on the Saskatchewan case study:

1. “*Symposium: Renewable Energy in Remote and Indigenous Communities*” by University of Saskatchewan, School of Environment and Sustainability (SENS) and SaskPolytech - this event allowed the meeting of international experts, government, industry, Indigenous people and community members to discuss topics related to bioenergy and to share best practices and challenges for the implementation of renewables in remote, rural, Indigenous and Northern communities. Topics were:
  - recognizing best practices in renewable energy;
  - ensuring good policy, engagement, and technology for success;
  - creating Indigenous, industry, government, NGO, and academic partnerships;
  - developing local and global solutions.
2. “*First Nations Power Authority (FNPA) 2017 - Western Canadian Indigenous Renewable Energy Forum*” - the goals of the event were to provide the opportunity to discuss and share lessons learned from Indigenous Leadership and Executives who have succeeded in bringing new economic development, community infrastructure and wealth to their communities through renewables. A key outcome from the Forum was the establishment of new connections and networks for Indigenous People in the renewable energy sector – enabling Nation to Nation exchange of ideas, learning and partnerships.

These experiences allowed me to meet and follow the presentations of a diverse group of bioenergy experts, policy makers, representatives of Canadian aboriginal communities, researchers from the University of Saskatchewan, but also general actors involved in the process of bioenergy diffusion: with them it was possible to deal with unstructured interviews or even to have clarifications on issues that were not clear to me.

In conclusion, renewable energies have the potential to be a valid starting point for the revitalization of rural areas, rebalancing the climate, the environmental, social and economic dynamics, which in recent decades have been distorted by the development of urban and industrial centres. Rural dwellers

around the world should be able to exploit the abundant renewable resources available to them, in order to become energy independent, diversify the production, and increase the revenues. To do this, they should be able to develop decentralized and small-scale renewable energy systems. This seems the most efficient and sustainable solution to ensure a fair distribution of benefits.

A consolidated approach is the identification of the most promising renewable resources exploiting local assets and implementing appropriate policies to promote their sustainability. An in-depth knowledge of the territory, as well as of the natural resources and the socio-economic dynamics of each specific case, is the first step in the process of development of rural areas and decision-making in support of renewable energies. Only a local approach allows renewables to represent a real opportunity that stimulates economic growth, social security in host communities and brings social, environmental, and financial benefits to rural areas.

Results show that both Canada and Italy are supporting the diffusion of renewables, creating opportunities at the local-rural level, with targets, initiatives and policies designed to maximize the value of local assets and limit environmental externalities. It is positive that governmental efforts continue to target the development of innovative renewable energy systems, energy efficiency and total decarbonisation of energy, as the world will demand more and more food and energy in the future.

A desirable scenario would start from the identification of local assets and community needs looking, and at the same time influencing, the wider policy framework and the related proposed targets.

Finally, the discussion of the results helped us to provide some recommendations that could be useful for future implementations of renewable energy policies in the two countries, in order to integrate renewables into rural development in the most sustainable way and in order to maximize the benefits for host communities:

- To generate the maximum benefits for rural businesses, small scale renewables plants for a distributed generation, even if not connected to the main national grid, should be more strongly encouraged.
- Renewable energy incentive should avoid the land use change (both direct and indirect) and the competition between energy production and food production. In this context, future incentive policies for biodiesel, biogas, and biomethane generation should discourage dedicated crops and encourage a model of sustainable agriculture, which limits GHG emissions and reduces the use of fertilizers and pesticides.

- With equal environmental benefits, the technological choice of the bioenergy systems should fall on the most inclusive approach at the social level, trying to involve the largest number of local agents and stakeholders, which offers more synergies with the existing industries in the area.
- The initiatives should be structured in a vision of perfect coordination and synergy with other initiatives at different levels of governance and with other policies that pursue long-term common goals.

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