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Summary

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Introduction

• From 2001-2015 Brazilian electricity industry faced three big challenges:
Introduction

• The Program Initial goal was to provide electricity for 10 million people, and it was achieved in 2009;
• By February 2015: 15.3 million people were attended!
• But during the Program development it was found that there were more people lacking of electricity
• So the program was extended until 2018.
Introduction

• Most of the attendance was done just by extending the existing network, but to a great number of areas this approach was too expensive;

• In those cases electricity was provided by individual generation systems or by minigrid generation systems
  – Power supply ranging from 13 kWh/month until 45 kWh/month

• Initially most of the projects were for individual systems but after 2009, it has changed and collective systems were also developed.
Introduction

• DSO main complaint was the lack of a solid regulation framework on the matter and also systems and equipment standardization (Normative Res. Nº 83/2004).

• So ANEEL and MME decided to build a robust regulation framework considering issues like: smart grid systems, net metering and balance and also decentralized energy supply, both connect and disconnected.
Objective

• And from this come the main objective of the article:
  – To try to visualize the regulatory framework enhancements for the promotion of decentralized energy supply and correlated issues;

• Themes like: Payment methods, Decentralized Energy Supply and Distributed Generation from renewable resources, Extension of Energy for All Program and smart grid were discussed in the last 4 years.
Methodology

• The regulatory framework improvements were studied considering information from 2009 until 2013.

• And divided on three topics:
  – Electricity For All Program
  – Distributed Generation and Smart Metering
  – Reference Project Auction’s
Act nº 12.111/2009 – Starting the Regulatory Framework Change

• Before 2009, the projects to supply electricity on remote or isolated areas were implemented just by ANEEL authorization and with a combination for LpT Program and DSOs Investments.

• Since Act nº 12.111, all the projects need to pass through an auction process to define which company will be responsible for the generation project and the system management.

• Projects could be done by individual and collective systems

• Projects should preferably use renewable energy
Regulatory Framework Evolution Since Act nº 12.111

- **2009**
  - Act nº 12.111
  - Normative Resolution nº 365

- **2010**
  - MME Ordinance nº 600
  - Decree nº 7.246

- **2011**
  - Normative Resolution nº 427
  - MME Ordinance nº 493 and nº 320
  - Decree nº 7.520
  - Decree nº 7.324
  - Decree nº 7.355
  - Decree nº 7.656

- **2012**
  - MME Ordinance nº 62
  - Normative Resolution nº 488
  - Normative Resolution nº 493
  - MMe Ordinance nº 341
  - Legislative Resolution nº 1.295
Investments on Decentralized Energy Supply in Brazil

• Brazil has done a number of initiatives to promote the use of decentralized electricity generation:
  – Strategic research and development projects leveraged by ANEEL
  – Electricity for All Program Projects and Reference Projects
  – World cup stadium solar plants.

• Amazonas Energia DSO has a 12 mini distributed generation facilities on 12 communities located on six cities in Amazonas (photovoltaic systems).
Investments on Decentralized Energy Supply in Brazil

• CELPA reference project named RESEX will provide electricity supply to 10 communities with collective systems (149 households) and 1,202 households with individual systems (solar+diesel)

• Urban Decentralized Energy Supply:
  – 18 R&D authorized projects with installed capacity range from 0,5 MWp – 3 MWp
  – Solar Word Cup Stadium Projects: 6 of World Cup Arena implemented
Conclusion

• The recent regulatory framework improvements made intending to promote the decentralized energy supply, also now government and private companies are starting to invest.

• Besides from the rural decentralized energy supply projects with solar energy, wind and diesel, also urban decentralized energy supply is being developed.