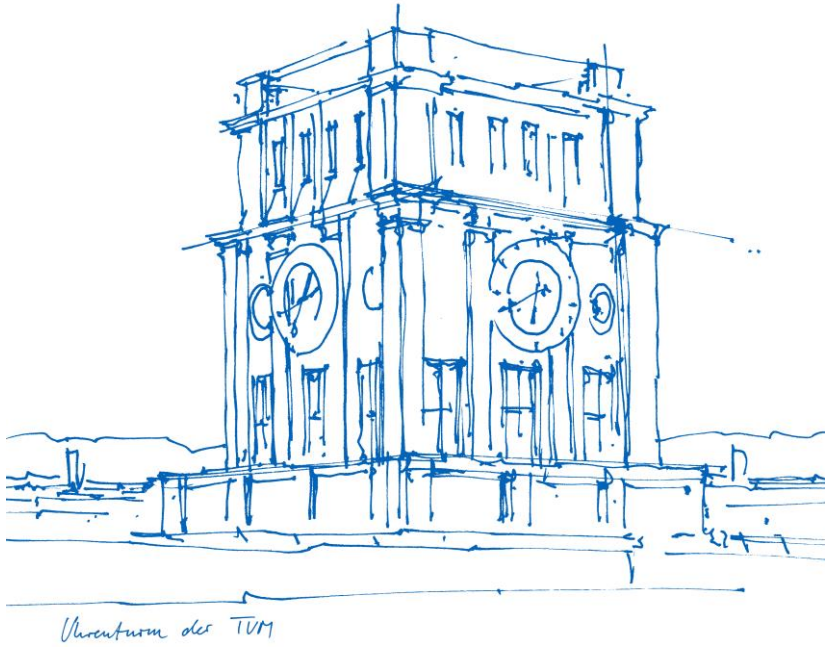
RLASS SYMPOSIUM

The Ecuadorian power sector planning from a multi-criteria analysis

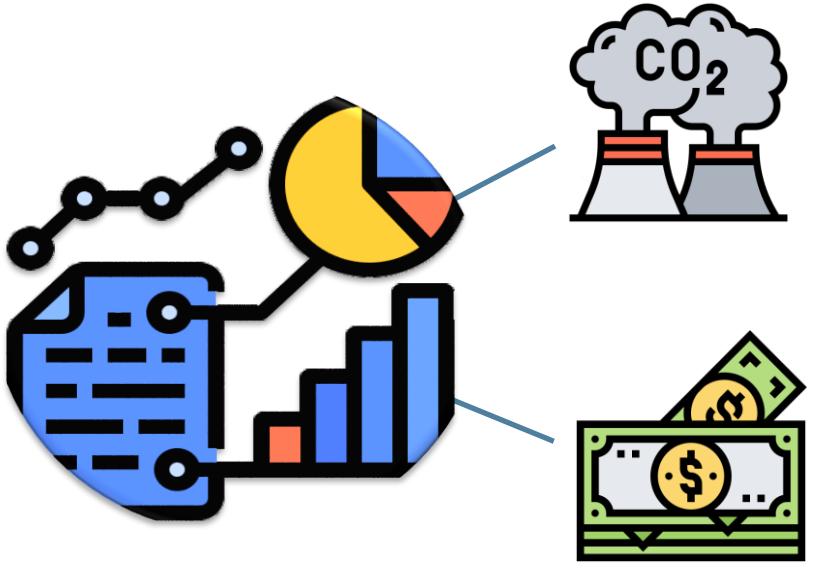
Carolina Godoy

Chair of Renewable and Sustainable Energy Systems
Department of Electrical and Computer Engineering
Technical University of Munich

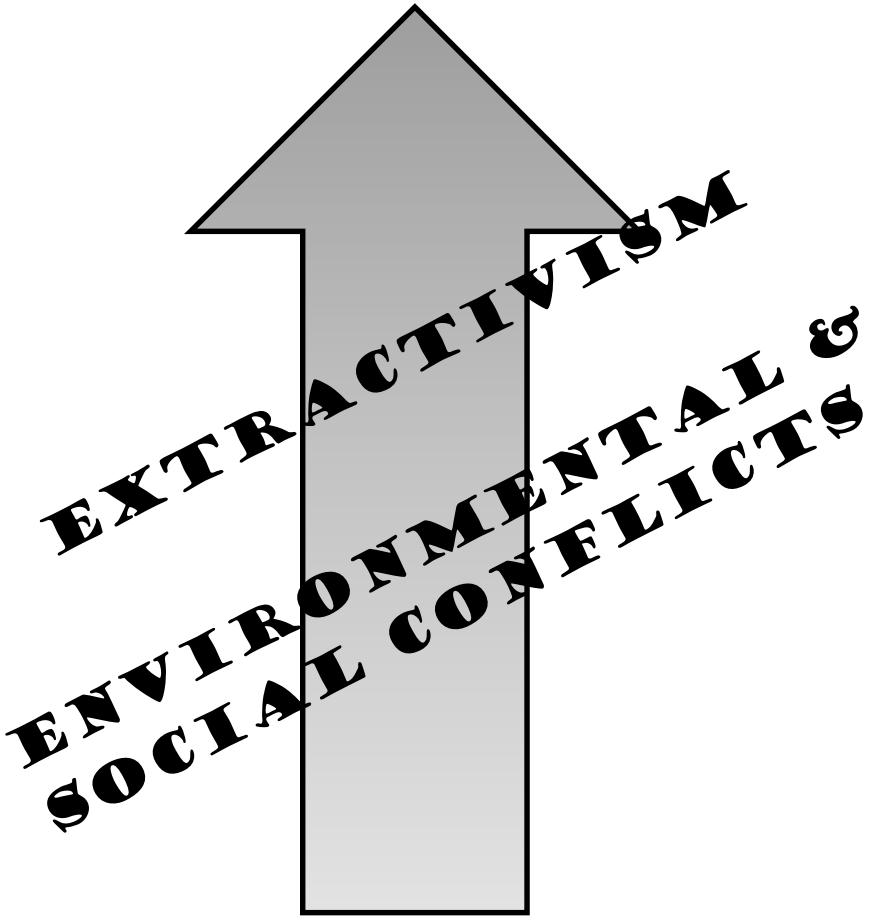
February 12, 2021



Energy modeling



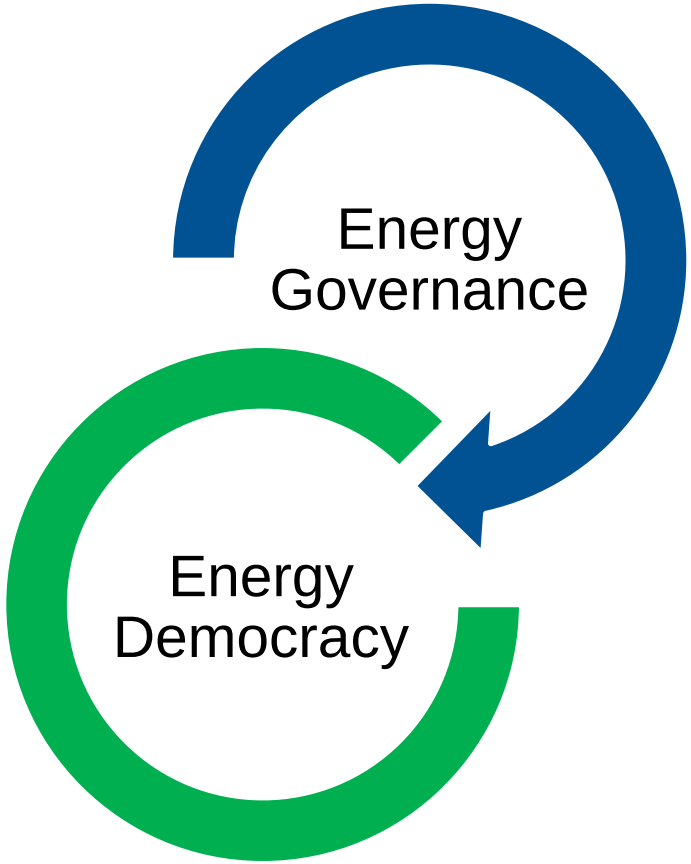
What is energy modeling?



What are the problems?

Source images: Flaticon.com

Theoretical background

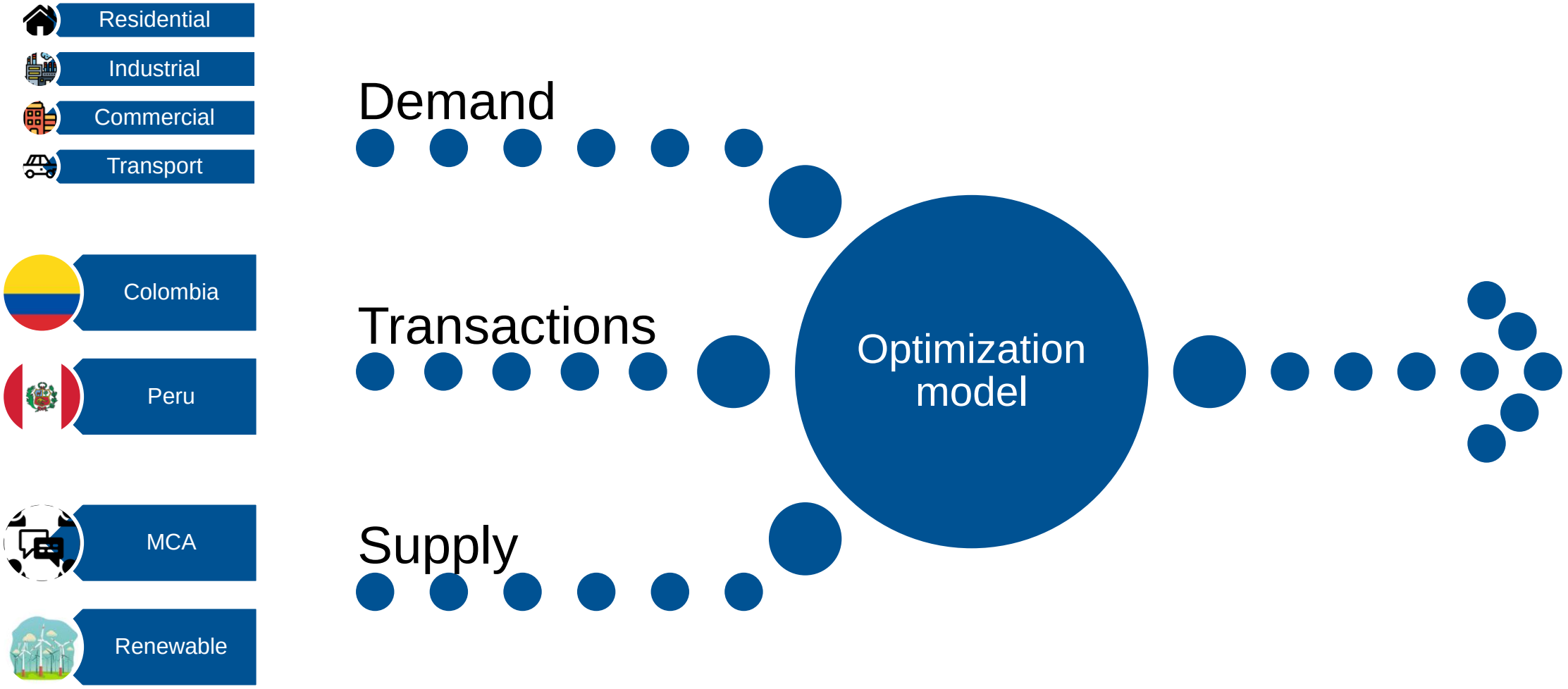


To stablish functional relations between different actors in the process of decide, execute, and evaluate decisions in the energy field.

To call for and justify integrations of policies linking social justice and economic equity with renewable energy transition.

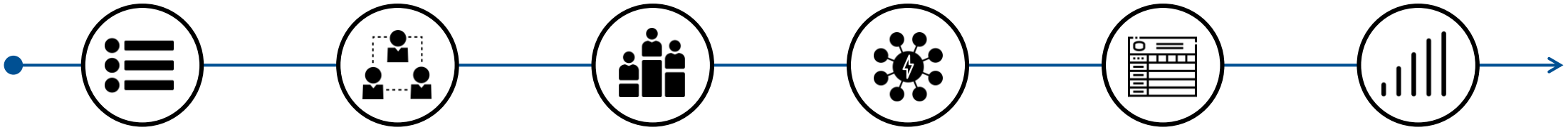
Source:Burke & Stephens, 2017; Whittingham Munévar, 2010 ; Pierre & Perters, 2000; Domínguez & Lowenthal, 1996

Energy modeling requirements



Source images: Flaticon.com

Multi-Criteria Analysis



Definition of criteria

Selection of actors

Weighting of criteria

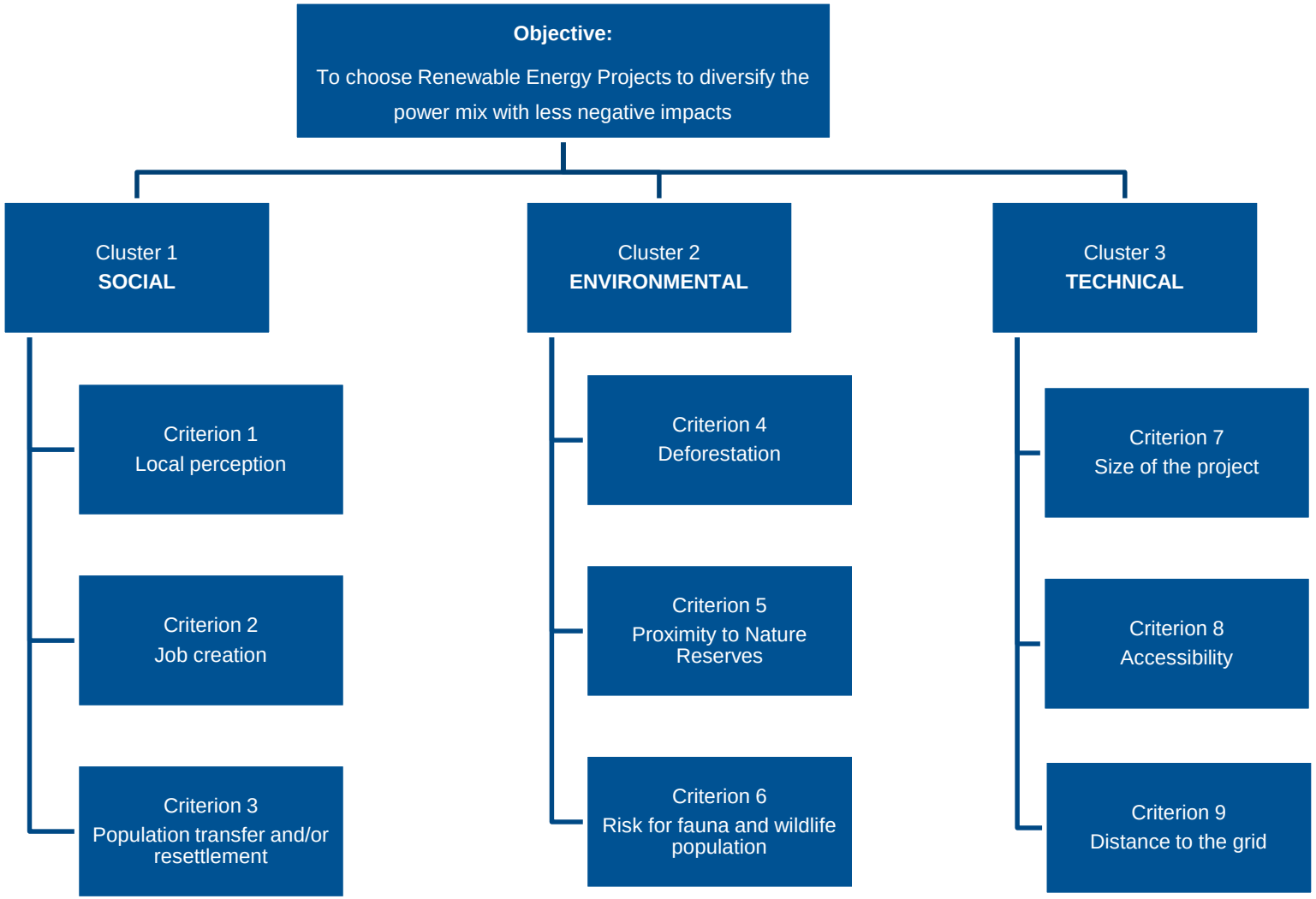
Selection of alternatives

Evaluation of alternatives

Ranking of alternatives

Source images: Flaticon.com

MCA: Criteria, and Actors



ACTORS

- Government Institutions
- Academic Institutions
- Local Communities
- Environmental Activists
- Private Sector (construction firms)

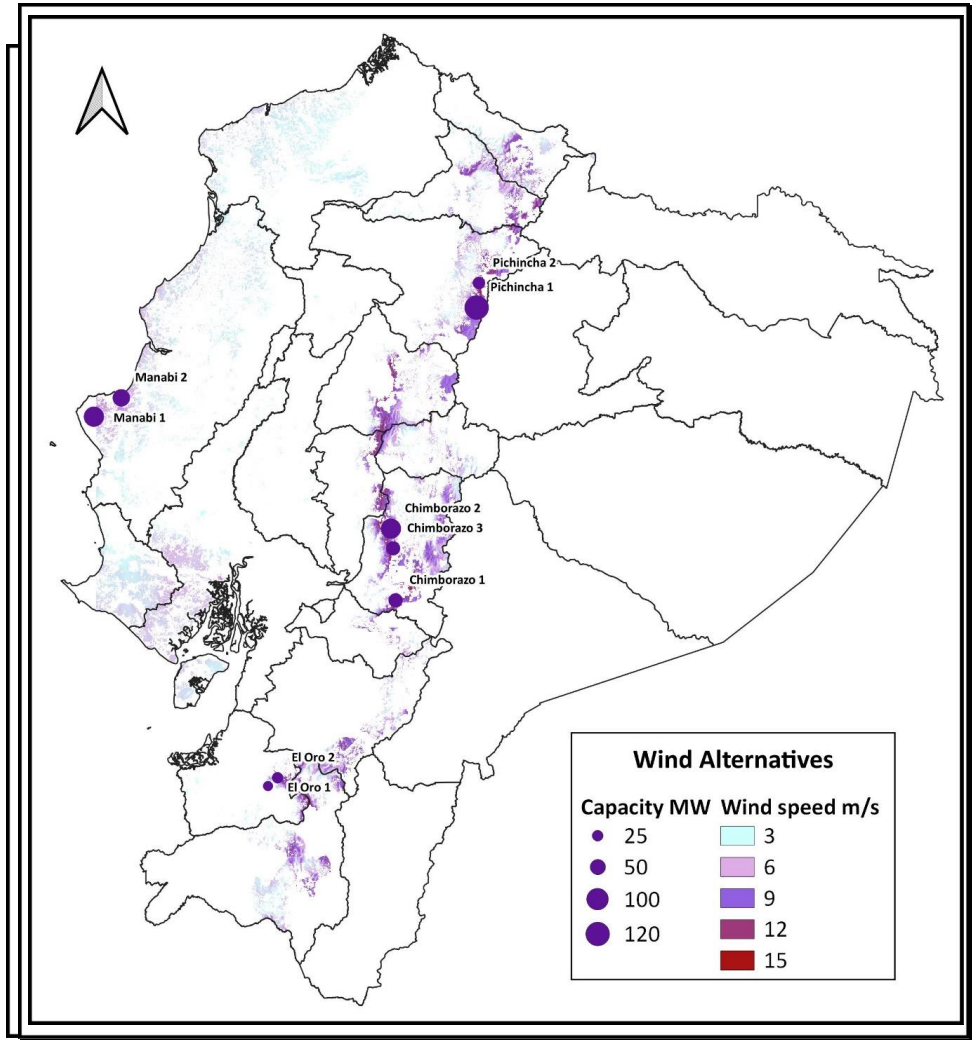
MCA: Selection of Alternatives

Resource	Alternatives (Projects)	Capacity
Hydropower	85	6729 MW
Geothermal	5	900 MW
Wind	9	519.4 MW
Solar	32	75216 MWp*
Total	132	83.4 GW

* Still in analysis

Projects proposed by the Ecuadorian Government

Projects proposed in our study

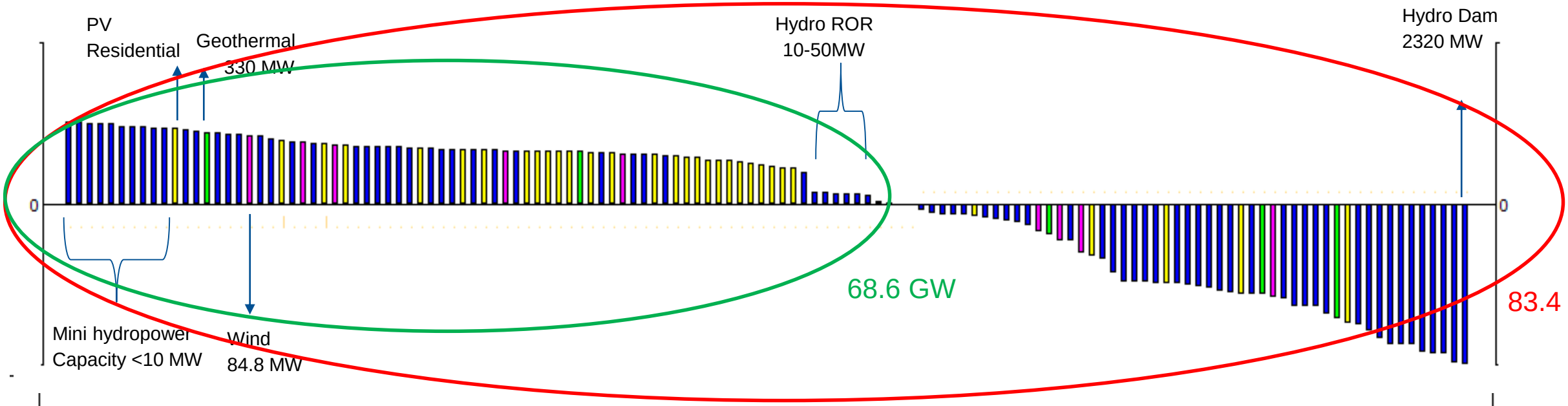


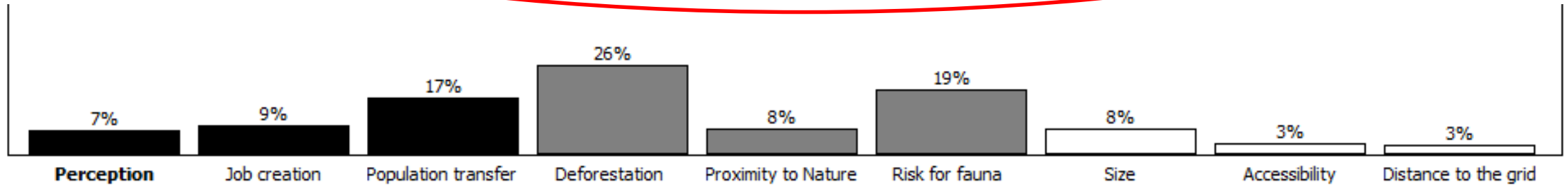
Alternatives for wind power

Alternatives for geothermal

Source: Estrada, 2020 ; Solargis, 2018

MCA: Ranking alternatives





Social criteria
Environmental criteria
Technical criteria

Benefits of our new model

- Provides decision makers with a more inclusive model for the Ecuadorian power sector
- Look for a *just energy transition*
- Think one step forward the classic extractivism model
- A model that can be adapted to every country necessities
- Learn from mistakes! During the power sector planning, design a model that considers the conflicts created around the projects to avoid them in the future, and not once the power plants are built

Carolina Godoy
carolina.godoy@tum.de