

# Integration of renewables into electricity markets: AMIRIS – An agent based model approach

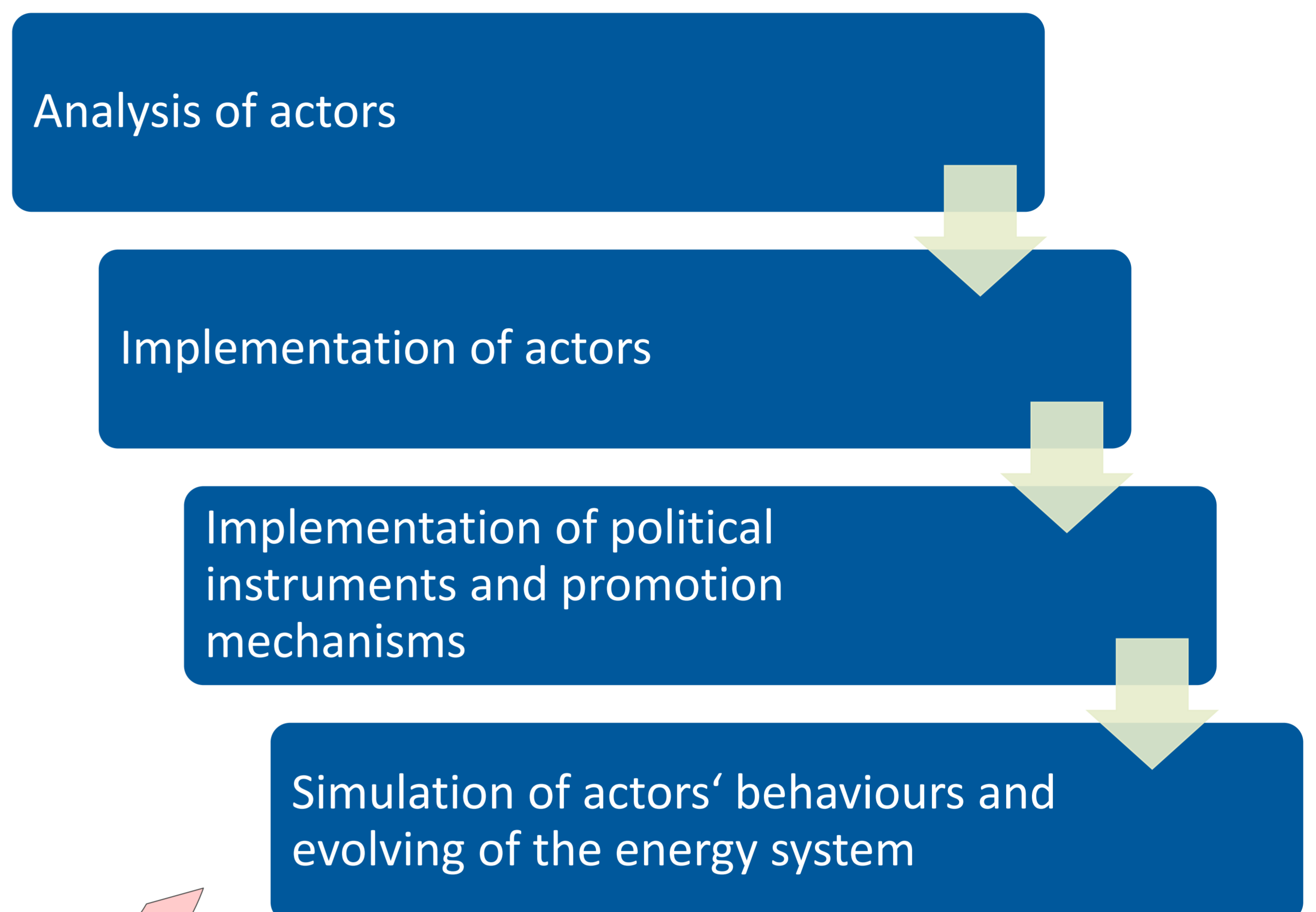
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## Agent-based modelling

ABM is based on autonomous agents that „live“ in a changing environment. These agents generally show the following characteristics:

- Own „view of the world“ as internal representation of the surrounding environment (uncertainty)
- Autonomous behaviour and individual objectives
- Development and adjustment of strategies to achieve objectives (learning)
- Ability to plan
- Communication and cooperation
- Bottom up approach with actors that are embedded in social systems

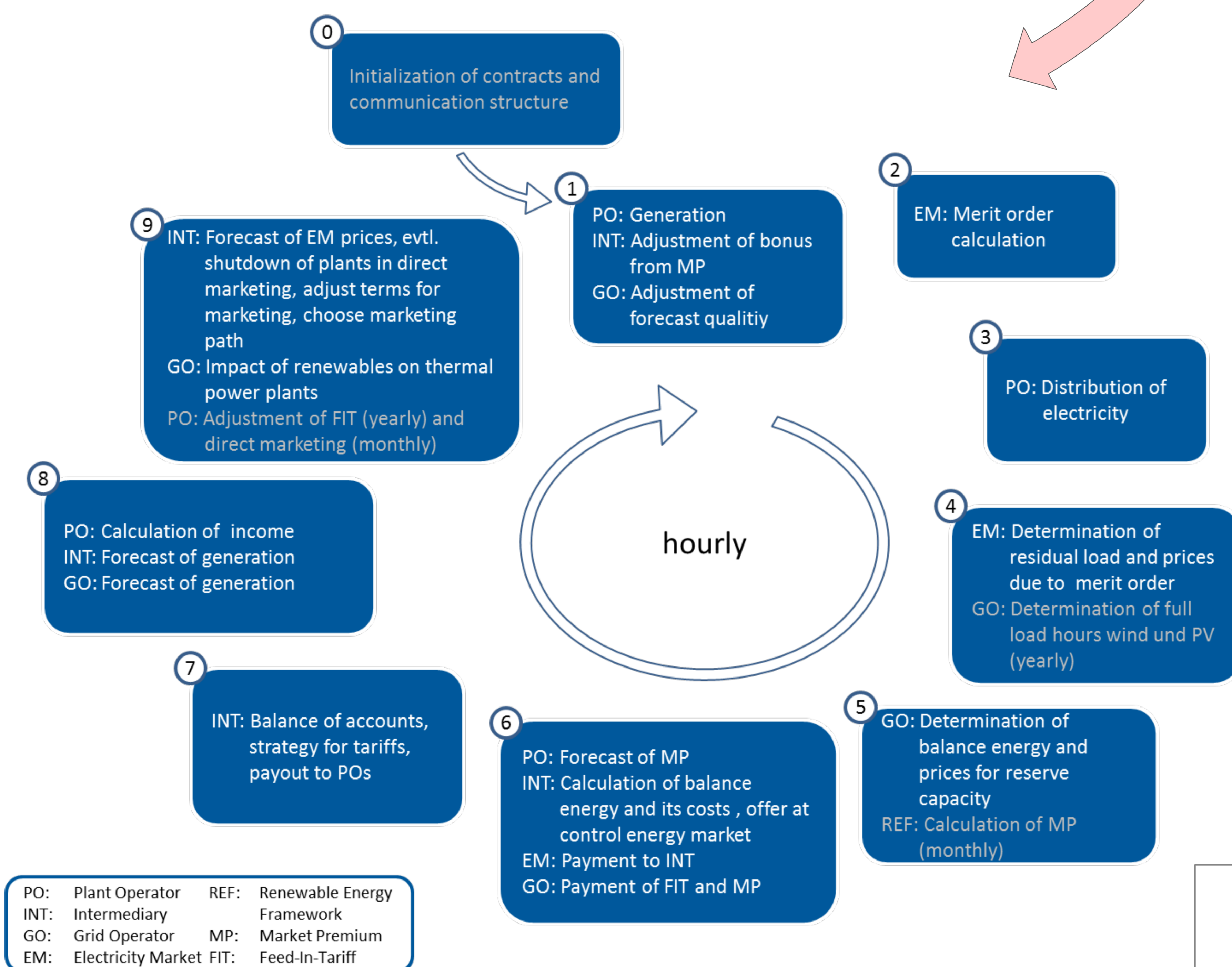


## Setup of AMIRIS

The agents interact in a dynamically changing environment influenced by the energy policy framework of RES and its corresponding support scheme as well as the Energy Industry Act (EnWG) and grid regulations. Implemented agents representing

- Political framework
- Plant operators
- Direct marketers
- Energy exchange market
- Grid operator

Characteristics of the agents are based on beforehand performed analysis of actors.



## Results and outlook

Processing the model with different political frameworks, the results show changes of plant operators' income as well as economic advantages and disadvantages of direct marketers depending on their experience, structure and size of portfolio. Macro economic effects are studied amongst others by relative market values of renewables.

New market design options are proposed to be implemented in the simulation for further quantitative studies.

