Introduction

* What is a prosumer
* What is a network of prosumers?
  + distributed energy market connected in a peer to peer based energy market
* How are prosumer networks paid today?
  + Net-Metering
* Current scenario in energy markets The current wholesale-electricity market on the distribution side does not support P2P electricity trading for prosumers. The reasons outlined in [8](vscode-webview-resource://5527a9c0-c891-435e-a793-932776b62666/file/Users/hxl0tp5/Desktop/FPLES_IT/Notes/Research/PHD/Dissertation/Work/smartgrid_coop_research/simulation_notebook/) are as follows:
* - The wholesale-electricity market sets a minimumcapacity barrier to become a participant in trading. The prosumers are small-scale power-generating units and are therefore not allowed in the wholesale-power market
* - The prosumers are not rewarded with the money instantaneously for energy that they have sold back to the grid [60].
* - The wholesale-electricity market is based on the centralized structure in which participants are limited. If prosumers, who are large in number, are allowed to participate, then there is a high chance of cyberattacks in the central system. This will cause significant monetary losses.
* - The ‘net-metering’ approach does not permit the prosumers to sell the energy at the price that they want to and allows only a fixed reward for energy sold.

- In the present scenario, the independent system operators (ISOs) collect bids from the large-scale powergeneration participants and then, depending on the market-clearance price, dispatch the electricity accordingly. Now, small-scale power-generating prosumers are very large in number and managing the electricity-trading market is not feasible for the ISO.

* emergeing blockchain technoology in paying prosumer networks
  + what it is

Future of paying prosumer networks based on Blockchain market - (NRG-X-Change)

Research

* What is a prosumer
* What is a network of prosumers
* What are methods to pay prosumers?
  + Net-Metering
    - Descripiton in general
      * Implementation by Government PURPA act
      * How its applied to prosumers in FPL's territory
      * Tiers
    - What are some challenges to NetMetering
      * retail payment of energy forces Distribution Service Operators to increase rates for everyone
      * production is not always balanced with consumption
  + NRG-X-Change
    - What are challenges to NRG-X-Change
      * requires additional equipment installed to track energy
      * proposes a new market based on distributed blockchain transactions
      * balance of consumption and generation
      * Requires designing proper implementation at different scales

Procedure

* Create model of a prosumer network
* Apply a payment method for prosumers

**References**

1. Prosumer Pricing, Incentives and Fairness, Ali Khodabakhsh, Jimmy Horn, University of Texas at Austin
2. "Emergence of blockchain-technology application in peer-to-peer electrical-energy trading: a review" Manish Kumar Thukral,Clean Energy, Volume 5, Issue 1, March 2021, Pages 104–123, <https://doi.org/10.1093/ce/zkaa033>