P2P Energy Trading

Section 1: Summary

Use Case Summary			
Use Case ID:	IND-002	**Use Case Type:**	*Vertical*
Submission Date:	December 17, 2018	**Is Use Case supporting SDGs**	
Use Case Title:	P2P Energy Trading	**Domain:**	*Industry*
Status of Case	*Proof of Concept (PoC)*	**Sub-Domain**	*Energy*
Contact information of person submitting/ managing the use-case	*Igor Ferreira [FOHAT]* *Chief Executive Officer* *igor.ferreira@fohat.co* *+55 41 9 9101-9222* *https://www.linkedin.com/in/figor*		
Proposing Organization	*FOHAT Corporation*		
Short Description	*Usage of token (NRJ TOKEN) and DLT (EW CHAIN) for energy trading of the Distributed Energy Resources (DERs) inside Blockchain Microgrids.*		
Long description	*By tokenizing the Energy Trading platform (RAPTOR) we will allow Prosumers to trade the energy from their Distributed Energy Resources (DERs) like solar panels, batteries and electrical vehicles in a peer-to-peer transactive network (P2P TE). That will allow people to Bring Your Own Devices (BYOD) into the Microgrids, which promote grid expansion and improves reliability and resilience of the grid network.*		
SDG in Focus (when applicable)	*7-11*		
Value Transfer:	*Tokens*	**Number of Users:**	
Types of Users:	*Energy Traders, Prosumers*		
Stakeholders	*Development Bank, Utility Companies*		
Data:	*=> Shared Data (DLT)* ● *Transaction history for audit purposes;* *=> Use case specific DLT data:* ● *Account;* ● *Token Balance;* ● *Forecasting;* *=> External Data (not stored in DLT):*		

	● *Energy usage inside Microgrid;*
Identification:	*KYC (Know Your Customer) for Energy Traders and Prosumers*
Predicted Outcomes:	The predicted outcomes are: ● Expansion of the Distributed Energy Resources inside Microgrids; ● Transparency of the investments done by Development Bank in the Energy Sector; ● Improved participation of Prosumers in a Free Energy Market;

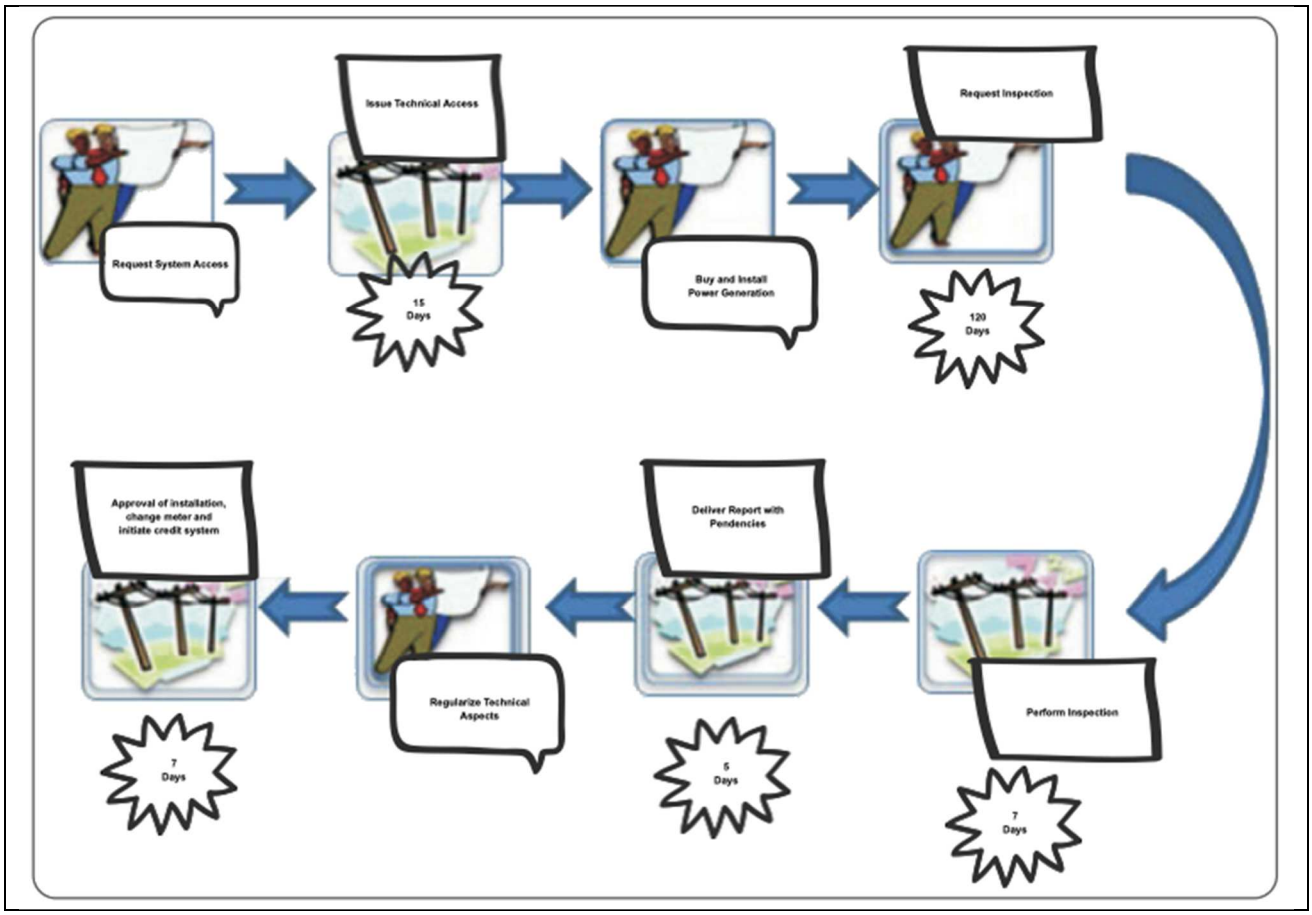
Overview of the Business Problem or Opportunity
The Energy Sector is key for the development of the society and to secure access to a comfortable life for everyone, is a key product/service that support people's life and the country growth. *The world is moving from a Centralized energy generation - based in big power plants - to a more Decentralized energy generation system which improves costs since the energy is produced and consumed closer. A lot of new energy generation is being deployed on solar rooftops, that needs to be integrated in technology arranges called Microgrids, which allows a better way to improve the energy flow and secure a more reliable system that can work both connected or disconnected of the main Grid..*
Why Distributed Ledger Technology?
In the Energy Sector a movement around Decentralization is already happening for power generation, but it's also needed to secure that the Grid is also Distributed when it comes to Operation and Accountability of the energy trading inside over-the-counter (OTC) transactions, DLT technology can scale the energy trading to be performed inside every Microgrid and in between Microgrids, it also allows a new layer of protection against cyber attacks in a infrastructure that is becoming more and more digitized.

Section 2: Current process

Current Solutions
Utility Companies - Distributed Generation Credit System

Existing Flow (as-is)		
Step	**User Actions**	**System Actions**
1.	User wants to produce energy by using their Distributed Energy Resources (like solar panels)	Request Utility Company to approve their project to be connected in the Distribution Grid
2.	User starts to produce energy	Utility provides credits

Process scheme (as-is)



Data and information (as-is)		
Data	**Type**	**Description**
1	*Documentation*	*RN 687/2015*

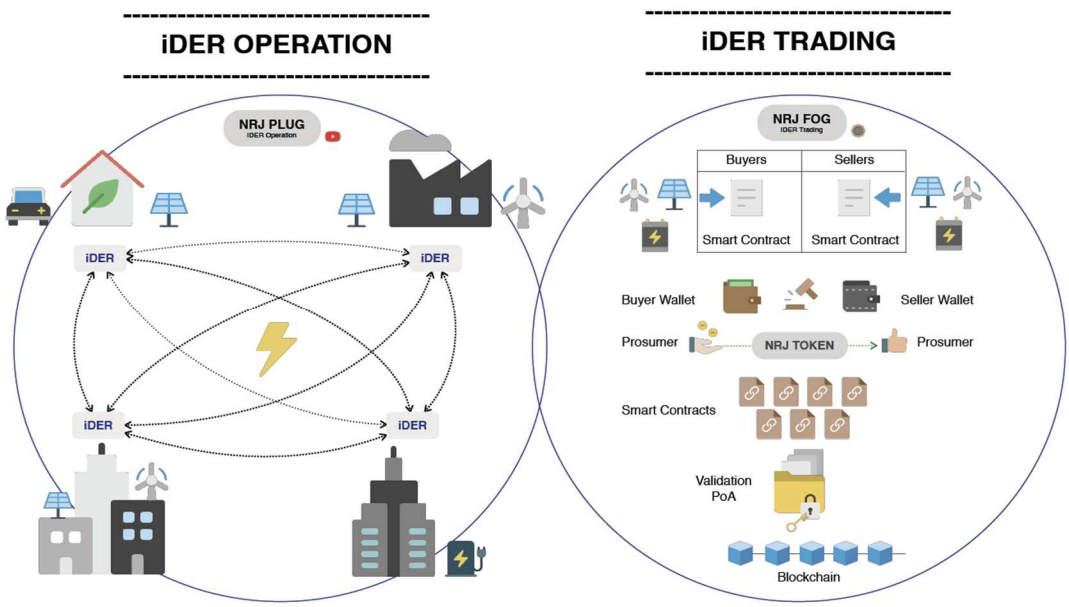
Participants and their roles (as-is)		
Actor	**Type/Role**	**Description**
1	*Users*	*Prosumers (Producer and Consumer)*
2	*Utility*	*Energy distribution and power grant*

Other Notes

Section 3: Expected process

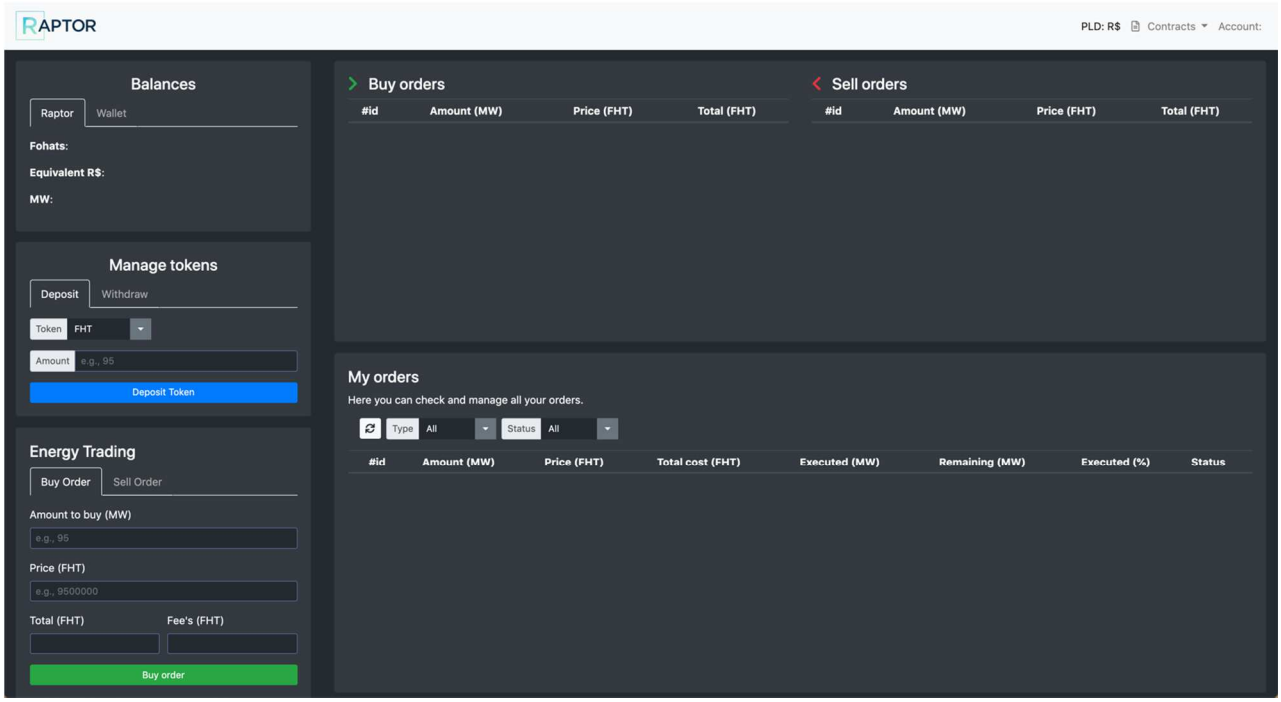
Expected Flow (to-be)		
Step	**User Actions**	**System Actions**
1.	*Prosumers*	*Request access to the Microgrid*
2.	*Utility*	*Provide access to the Microgrid*

Process scheme (to-be)

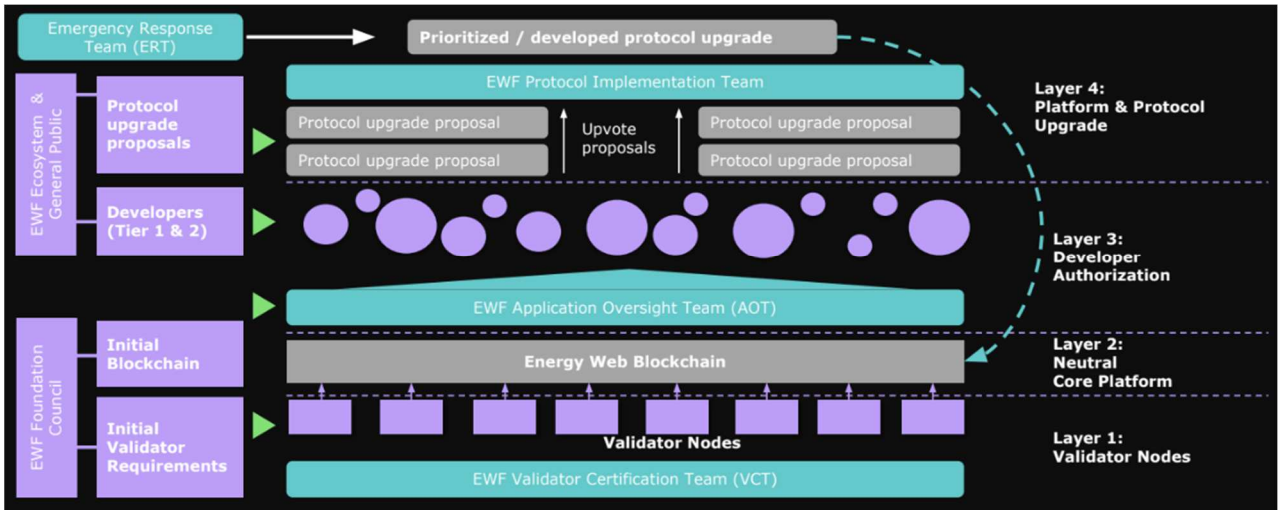


iDER OPERATION (I-GRID)

iDER TRADING (RAPTOR)



EWF Solution

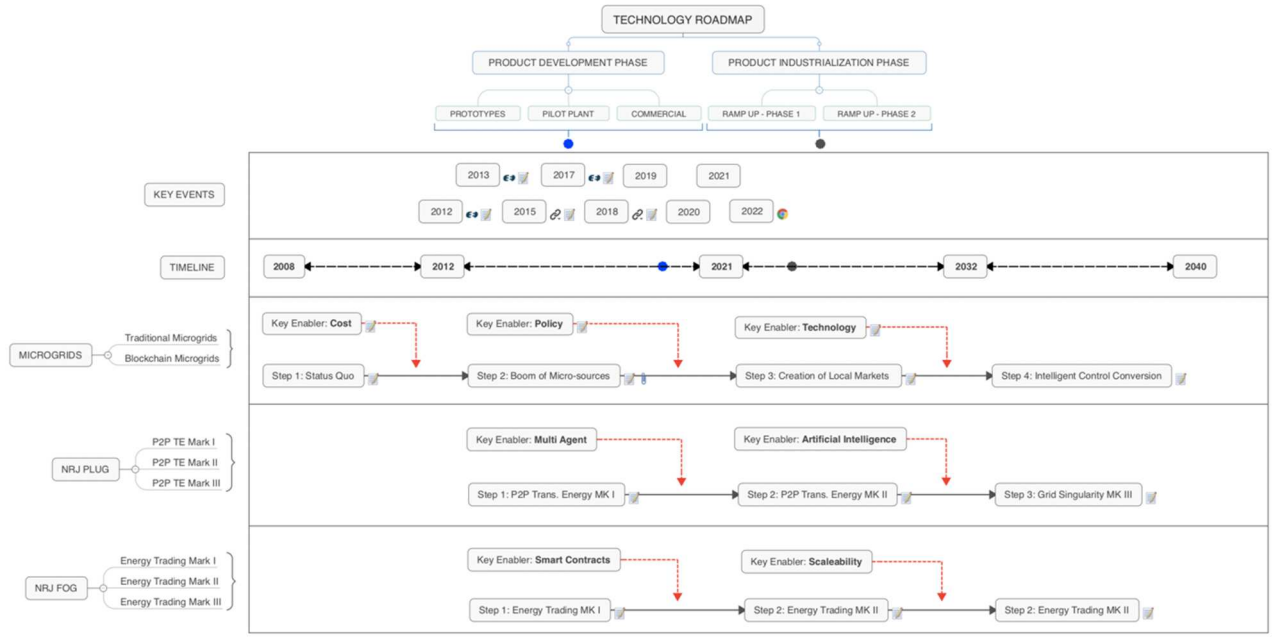


Participants and their roles		
Actor	**Type/Role**	**Description**
1	*Prosumers*	*DER owners*
2	*Energy Retailers*	*Sell excess energy from DER Owners.*

Data and information		
Data	**Type**	**Description**
1	*Documents*	*RN 687/2015*

2	*Smart Contract*	*P2P Energy Trading*

Security and privacy
1.According to EWF Chain solution

Main Success Scenario + expected time line


Conditions (pre- or post-)
1. EWF Chain solution deployed
2. FOHAT I-GRID and RAPTOR solution deployed

Performance needs
1.According to EWF Chain solution

Legal considerations
Different Regulation between countries can offer legal restrictions for operation of a free market

Risks
Regulation

Special Requirements
Standards for communications between different DERs (Distributed Energy Resources) like Open Protocols.

External References and Miscellaneous

https://www.youtube.com/watch?v=PFKMwJL8-RI

Blockchain Solutions for the 3Ds of the Energy Industry

Presented by Jorge Alvarado
Blockchain Architect/Manager at Swisscom Blockchain
20.04.2018

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Other Notes

N/A

Appendix 1:
Domains and subdomains for use cases categorization

Vertical:

1. Finance
    a. Financial management & accounting
    b. International & interbank payments
    c. Clearing and settlement
    d. Reduction of Fraud
    e. Financial messaging
    f. Asset lifecycles and history
    g. Trade finance
    h. Regulatory compliance & audit
    i. AML/KYC
    j. Insurance
    k. Peer-to-peer transactions
2. Healthcare
    a. Pharma
    b. Biotechnology
    c. Medicine
3. Industries
    a. Manufacturing
    b. Energy
    c. Chemical
    d. Retail
    e. Real estate
    f. IT and telco
    g. Supply chain management
    h. Transportation
    i. Agriculture
4. Government and public sector
    a. Taxes
    b. Government and non-profit transparency
    c. Legislation, compliance & regulatory oversight
    d. Voting
    e. Taxation and customs
    f. Intellectual property management
    g. Land Registries

Horizontal:

1. Identity management
2. Security management
    a. Public Key Infrastructure
3. Internet of Things

4. Data processing, storage and management
    a. Data Validation (includes provenance)
