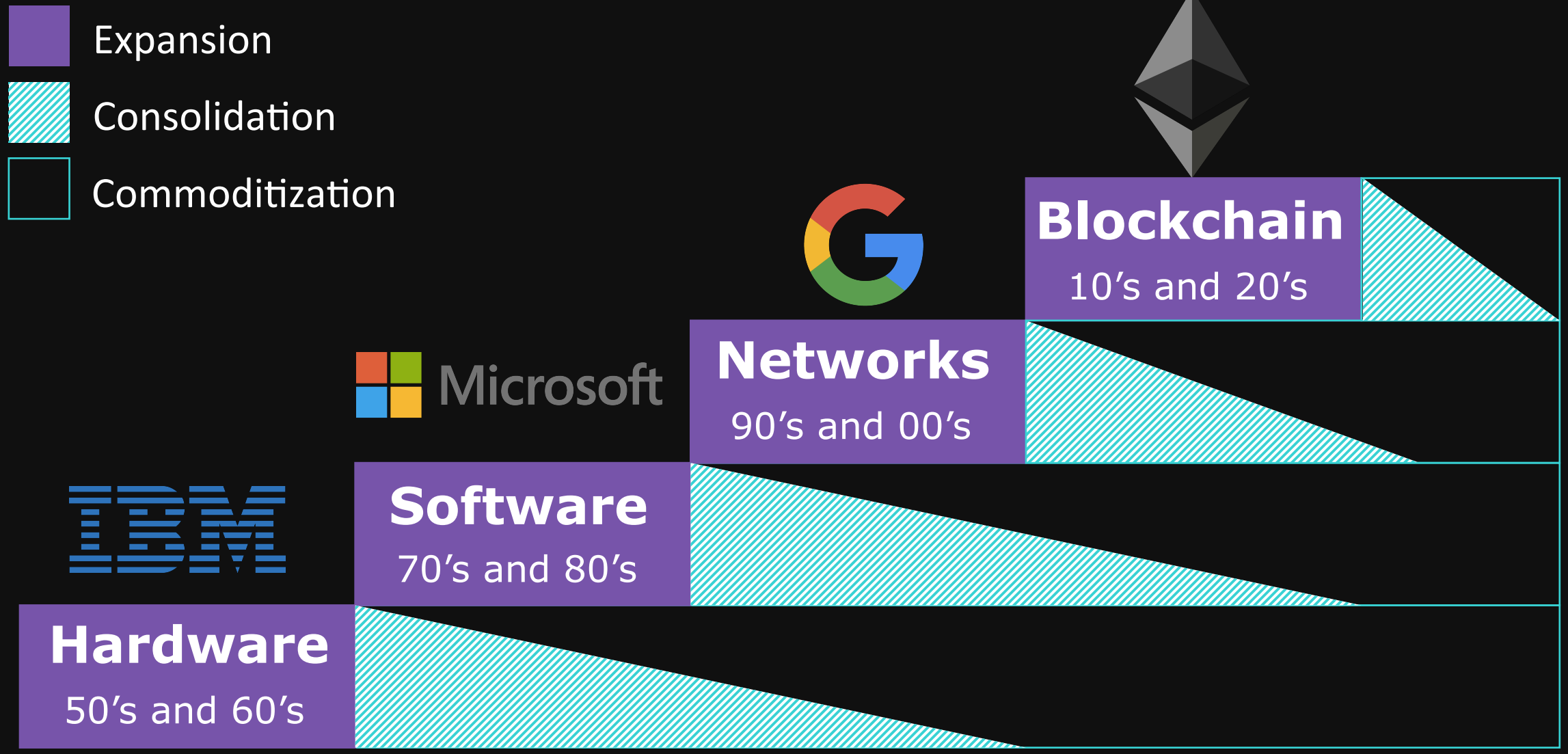
Using blockchain tech to decarbonize, digitize, and decentralize electric grids worldwide

5 September 2018
IRENA Innovation Week
Bonn, Germany

Doug Miller

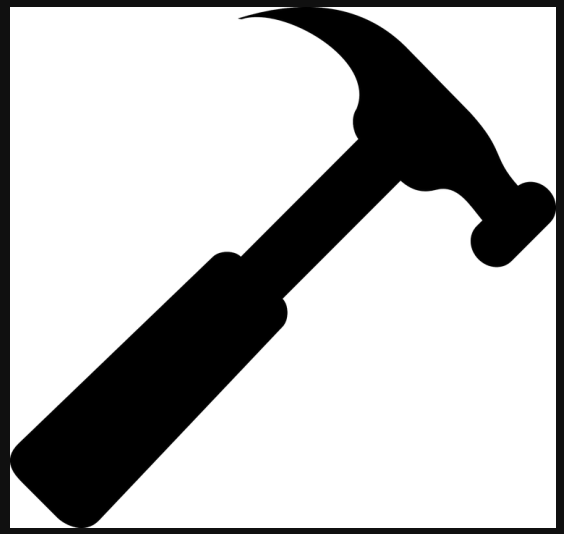
energy web
FOUNDATION

A history of computers

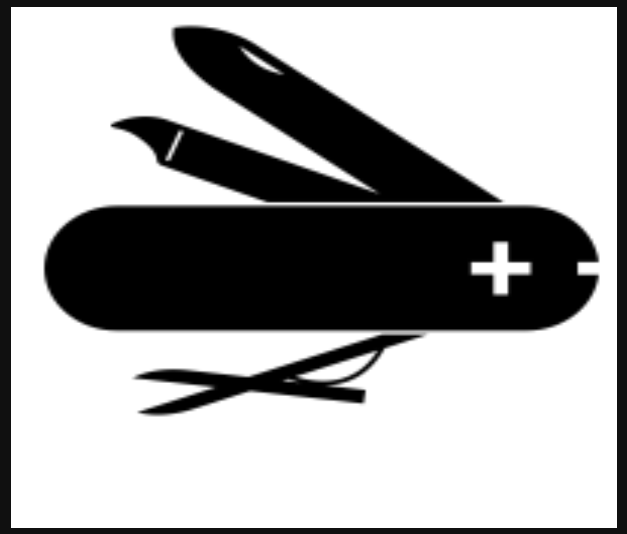


Blockchains are decentralized networks

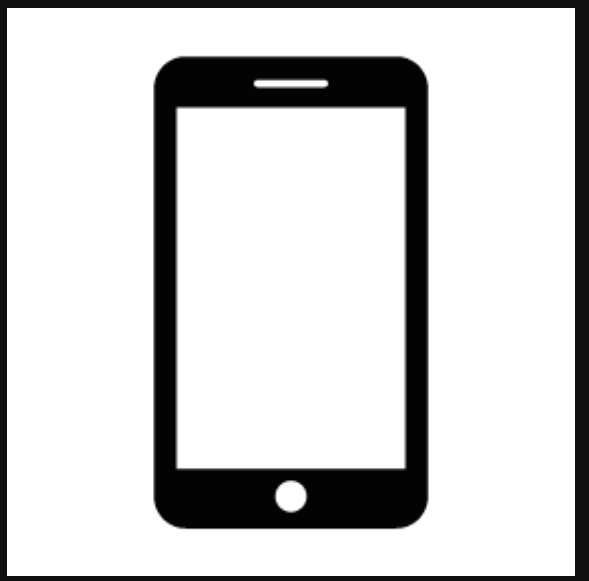
Time



Single Purpose



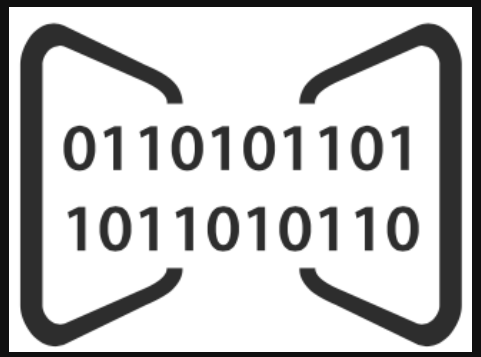
Multi-Purpose

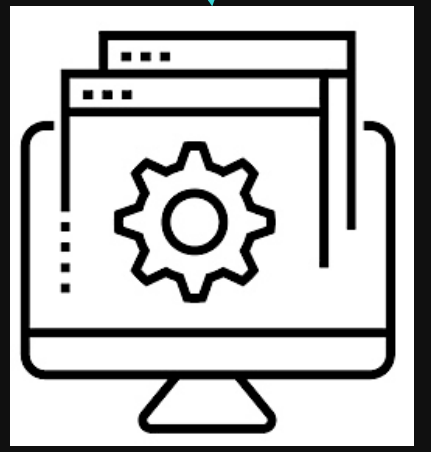


ANY purpose

Blockchains are decentralized ~~networks~~ *computers*

Interactions





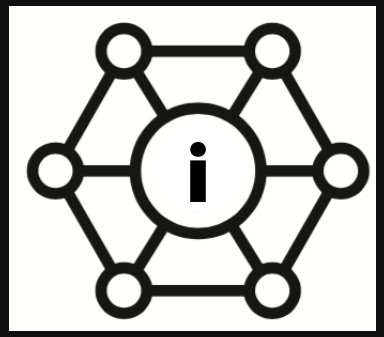
Create user accounts

Read and write data securely

Write and run programs

Blockchain technology introduces new value propositions

Single system of record enables **“trustless” consensus** and direct, low-cost transactions between parties



Strong cryptography protects sensitive information; neither data nor programs can be manipulated

Open-source platform capable of supporting and interacting with other public and private systems

Immutable ledger supports **transparency and auditability** for any type of asset

The Energy Transition

20th-century models clashing with 21st century technologies

Legacy system architecture

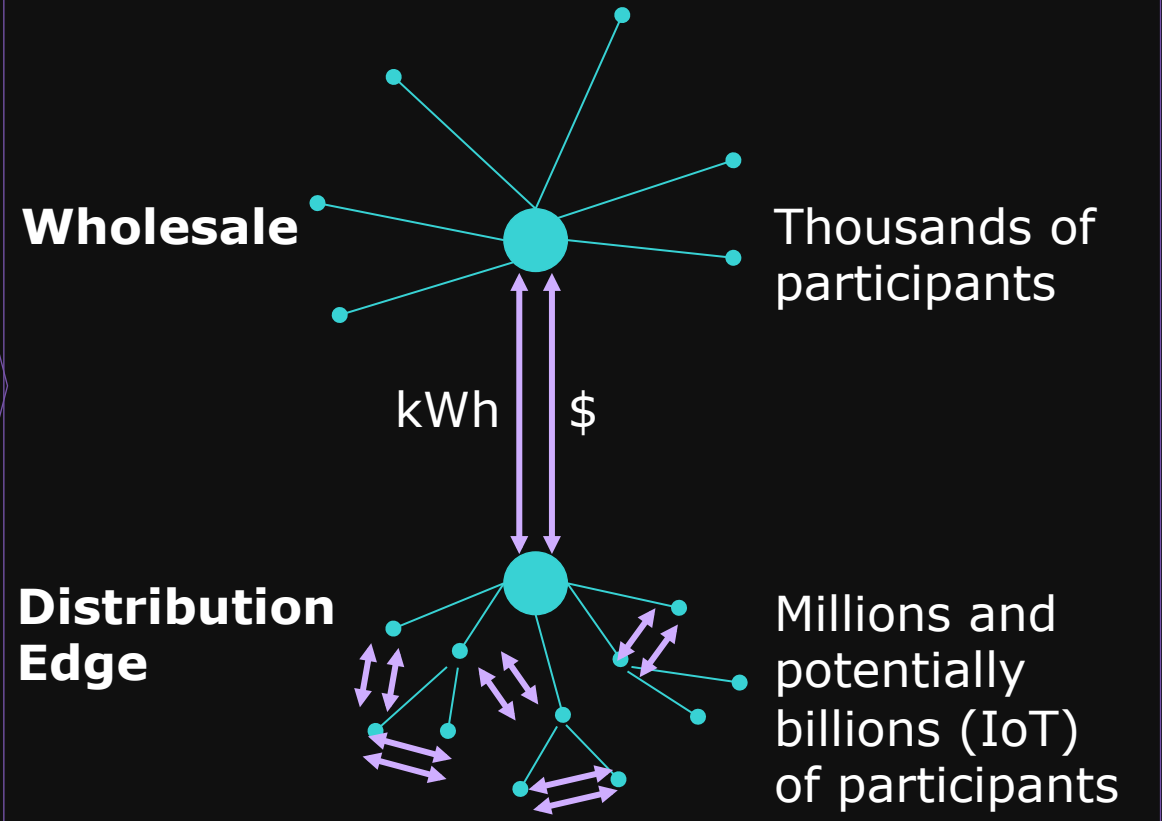
Utility

kWh

$

Customer

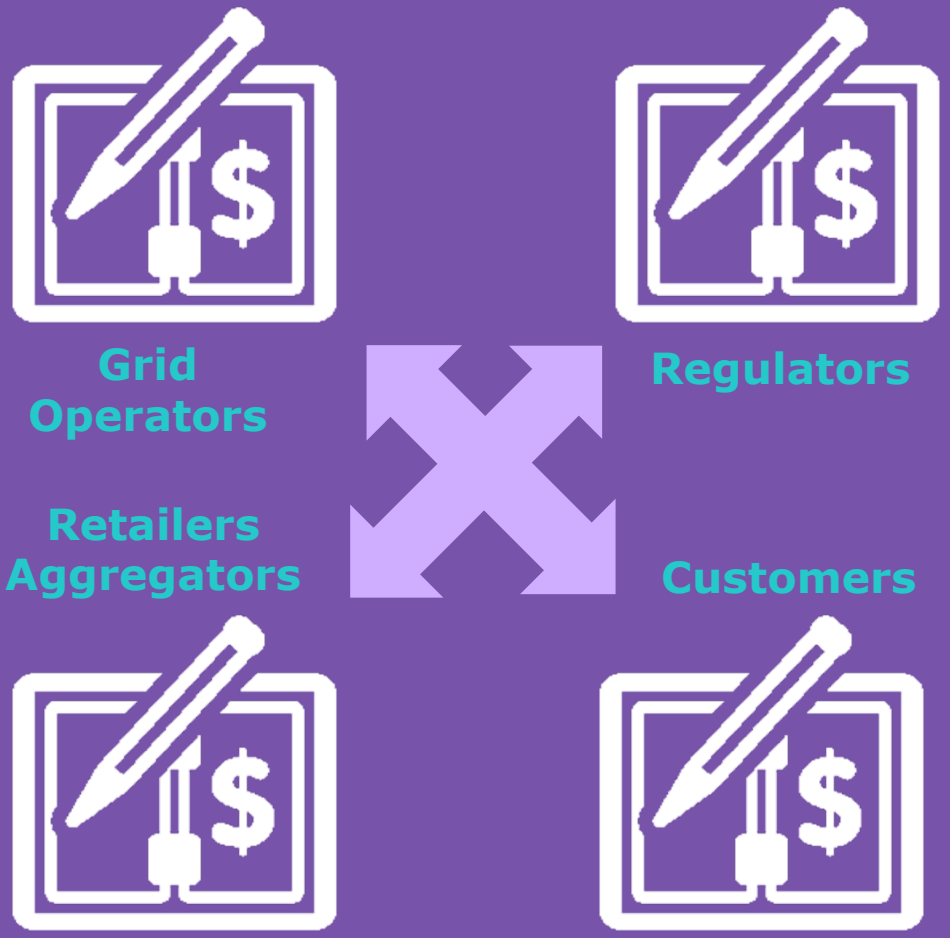
Emerging system architecture



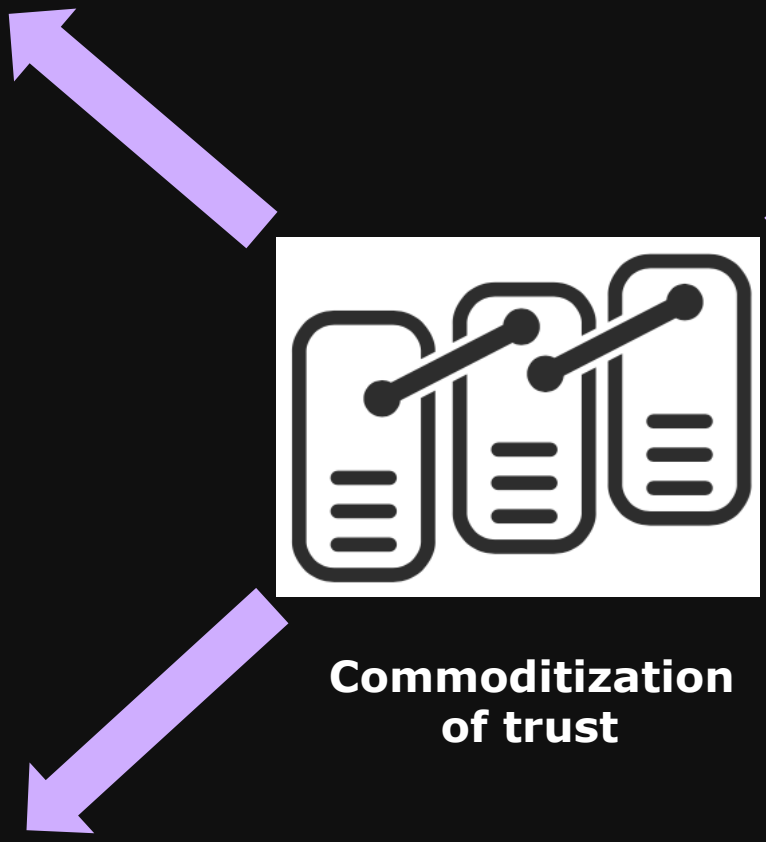
Digital DNA for the Energy Sector

Through digitalization, blockchain enables disruptive business models

Without blockchain (today)



With blockchain (tomorrow)

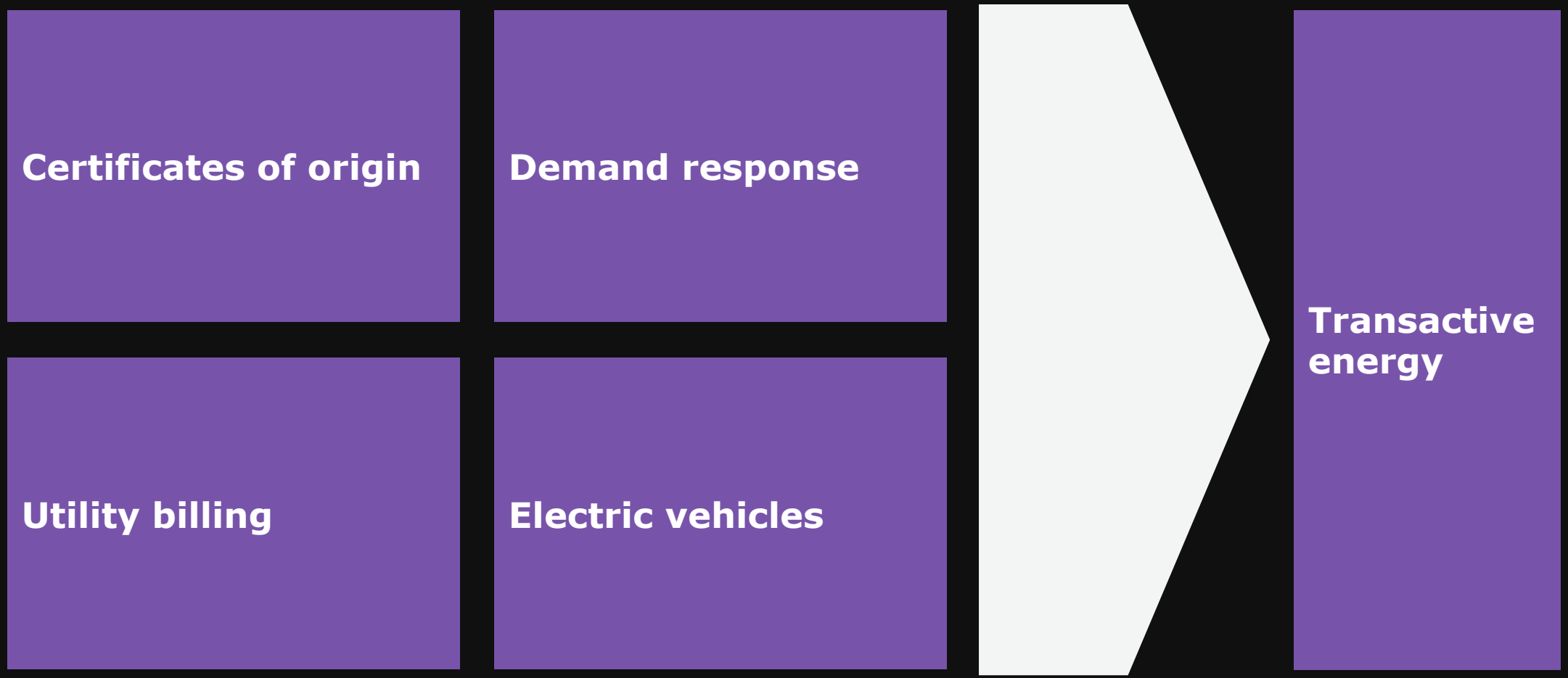


Energy Web Foundation (EWF) is leveraging blockchain to enable and accelerate the global clean energy transition

EWF's mission	**Enabling and accelerating the transition to a democratized, decentralized, decarbonized, and digitized electricity grid**. EWF achieves this by creating the virtual infrastructure—a shared digital DNA for the global energy industry—that serves as its foundation.			
Pillars of EWF's work	**Core Technology** Developing a high performing core blockchain technology fit for energy sector applications	**Ecosystem** Facilitating, educating, and incubating a diverse ecosystem in support of the technology	**Regulatory Engagement** Educating and engaging with regulators to inform regulatory integration	**Application Acceleration** Supporting EWF Affiliates to launch early applications and spur market growth

EWF is accelerating the development of the most valuable blockchain-based energy sector dApps

EWF's ecosystem has prioritized these five application domains:



EWF is developing the open-source Energy Web Origin dApp for certificate of origin markets

The first 5 simulated transactions—involving real companies, with real physical assets, and actual, real-time generation and consumption data, but no financial transfer—illustrate its current capabilities

Use scenario	Generator		Buyer
Green attribute ownership transfer based on demand of buyer	Engie	→	Microsoft
	SP Group	→	DBS
	TWL	→	E.ON
Consumption-based ownership transfer	German households	→	EWF Berlin office
Tracking battery off-take vs. injection	Sonnen	→	Sonnen

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EWF is preparing for the full release of EW Origin in Spring 2019 when the Energy Web goes 'live'

Example of a single simulated transaction between Engie and Microsoft in France

Certificate Id	Current Owner	Claimed	Producing Asset Id	Co2 saved (kg)	Certified Energy (kWh)	Creation Date
0	Microsoft Corporation	no	0	0.001	10.000	12 Apr 18

Asset Owner	Certified by Registry	Kind	Geo Location
Engie AS	none	Production	50.654188, 3.65156

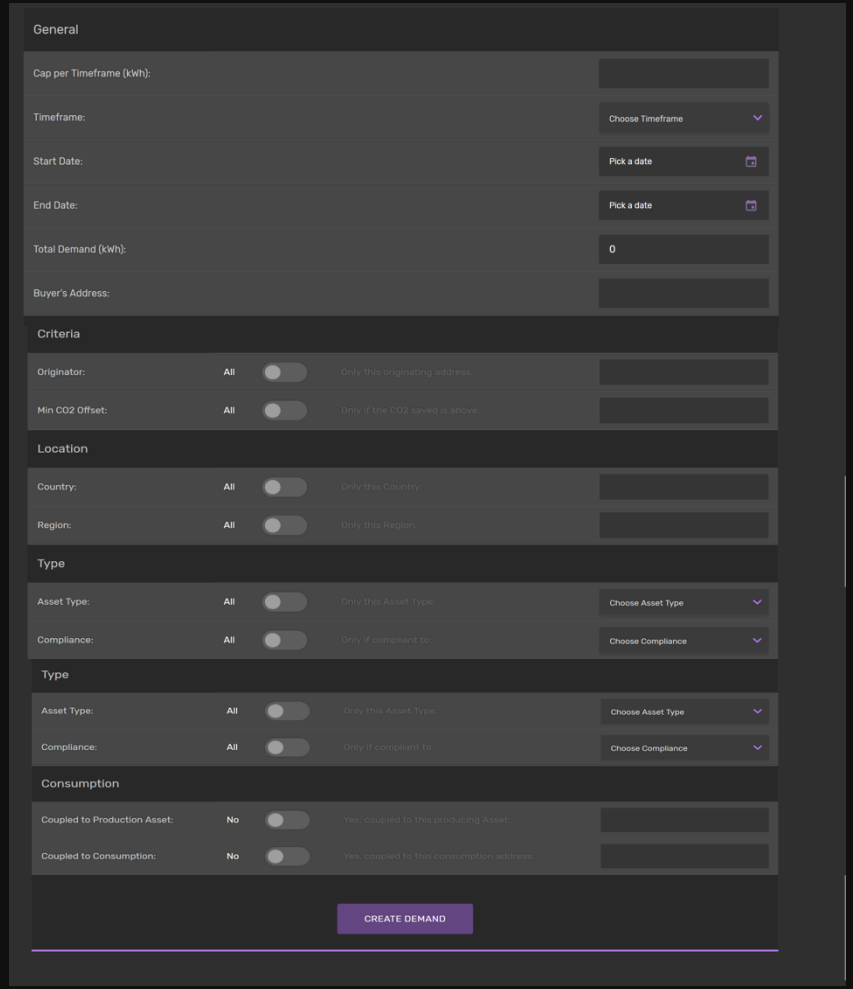
Asset Type	Other Green Attributes	Commissioning Date
Wind	N.A	01 Jan 70

Public Support	Nameplate Capacity
N.A	6000.000 kW

12.4.2018, 13:16:00 - 0xf45f139a6f871bb919edab254e2f3fc91fcdd6b232beec00b6098225df61cee1
Certificate Created - Initially owned by Microsoft Corporation

12.4.2018, 13:15:00 - 0x27ba3923c448135aa696986bfe1ea721b646daafdae2161a8f75d5fea90d7b28
Initial Logging - Logging by Asset #0

v1 form to initiate green energy smart contracts



Thank you!

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