White Paper

Blockchained Energy and Telecommunications ‚RĪX‘

Table of Contents

Business and Industry Analysis

Business and Industry Analysis

1.1 Africa's Energy Bottleneck

Why are 600 million Africans still without energy?

Sub-Saharan Africa, home to more than 950 million people, is the most electricity- poor region in the world. More than 600 million people lack access to electricity and millions more are connected to an unreliable grid that does not meet their daily energy service needs. Most countries in this region have electricity access rates of about 20% and two out of three people lack access to modern energy services. The average annual electricity consumption in the Sub-Saharan residential sector is 488 kilowatt hours (kWh) per capita—equivalent to about 5% per capita consumption of the United States.

The International Energy Agency (IEA) forecasts the total demand for electricity in Africa to increase at an average rate of 4% a year through 2040. To meet this growing demand, the region will need to significantly expand its installed generation capacity and make extensive upgrades to the power grid. At the current pace of electrification and population growth, more than half a billion people are expected to remain without access to electricity by 2040. Full electricity access in the region is not estimated to be accomplished until 2080. Hence, sub-Saharan Africa is burdened with a complex and persistent electricity gap. The electricity gap refers to both the supply-demand mismatch in grid-connected regions and the lack of access in off-grid regions. Closing the electricity gap in Sub- Saharan Africa is a multidimensional challenge with important implications for how to frame the region's energy problem as a whole.

Sub-Saharan Africa has high income and wealth inequality which leads to vast differences consumers' desire and willingness to pay for electricity. Its countries display large disparities in electricity costs, with South Africa and Zambia among the lowest, and Djibouti and Gabon among the highest.

Business and Industry Analysis

1.1 Africa's Energy Bottleneck

Access to electricity is also highly unequal, even among people who are connected to the grid. Some people cannot afford to consume the high costs of electricity (average $0,25/kWh) despite being connected. Therefore, they cannot consume enough electricity to make use of modern energy services. They may also suffer disproportionately high levels of service interruption, with no ability to depend on expensive on-site diesel generators like wealthier people are able to afford in the same region. The electronic appliances that the region's consumers will purchase, many for the first time, will be more efficient than the current stock in many wealthier economies.

Hence, the pace, level, and profile of electricity demand in sub-Saharan Africa will evolve differently. There are technological, geographical, cultural, and social distinctions that suggest the region should define its own target standard of living and type of energy services to be pursued, rather than comparing itself with wealthier countries. These estimates, however, may be conservative owing to the latent demand that remains unmet as a result of lack of grid access in rural areas.

Countries in Africa are estimated as losing 2– 4% of GDP due to power shortages (Africa Progress Panel, 2015); however the emphasis in such analysis is more often placed on the power needed by large firms, as opposed to the currently relatively small consumer base connected to the grid.

Africa will not be able to accelerate and sustain growth without adequate access to energy. Sub-Saharan Africa, has only 300,000 km of power lines compared to over 10 million in the European Union. When centralized and distributed grids are built with the intent to integrate and connect them in the future, they can have strategic synergies. Effective frameworks must be put in place to facilitate this. Finally, utility and tariff structures can be reformed to reflect fair and stable rates that ensure reliable delivery to end-users. The region will face significant economic, environmental, political, and operational challenges and trade-offs on the way to achieving these goals. To understand the scale of these challenges, there should be an open-access power system model to analyze optimal pathways for expanding supply capacity.

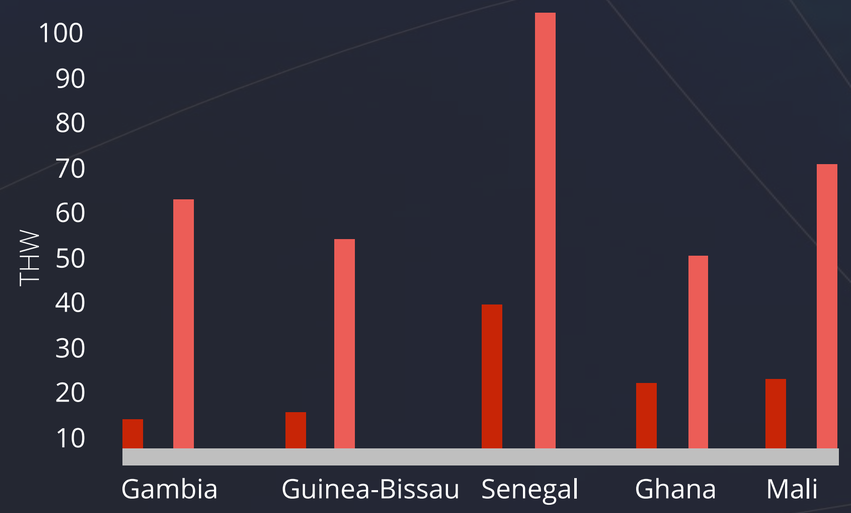
This model must compare the average costs of various expansion scenarios for achieving reliable and affordable power while also exploring the roles of renewables in the electricity mix under various demand growth, and policy conditions.

Business and Industry Analysis

1.1 Africa’s Energy Bottleneck

By 2030, Africa’s total net electricity generation is expected to be between 1,800 TWh and 2,200 TWh, approximately a threefold increase from 650 TWh in 2010. This range would require installed capacity between 390 GW and 620 GW. In 2010, capacity was 140 GW, implying that an additional 250 GW to 480 GW of new capacity is needed by 2030. The wide range reflects the fact that renewable generation typically has a lower capacity factor. More use of renewable energy in the mix means more total capacity is needed. Therefore, the range for capacity needs under the renewable-promotion scenarios is substantially wider, at 430 GW to 620 GW, than in the renewable-limited scenarios, at 390 GW to 440 GW. A quarter of the existing 54 GW of generation capacity is expected to be retired before 2030, that means requiring at least 500 GW in capacity is needed to meet demand by 2030.

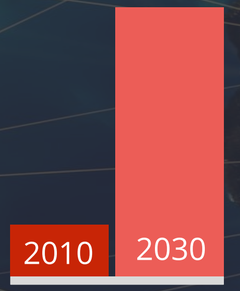
West Africa Electricity Supply Mix (Generation and net imports) and 2030 required scenario.



Population 900 million

600 million Africans with no access to electricity

300 Tkm power lines compared to 10 million in the EU



Electricity capacity required

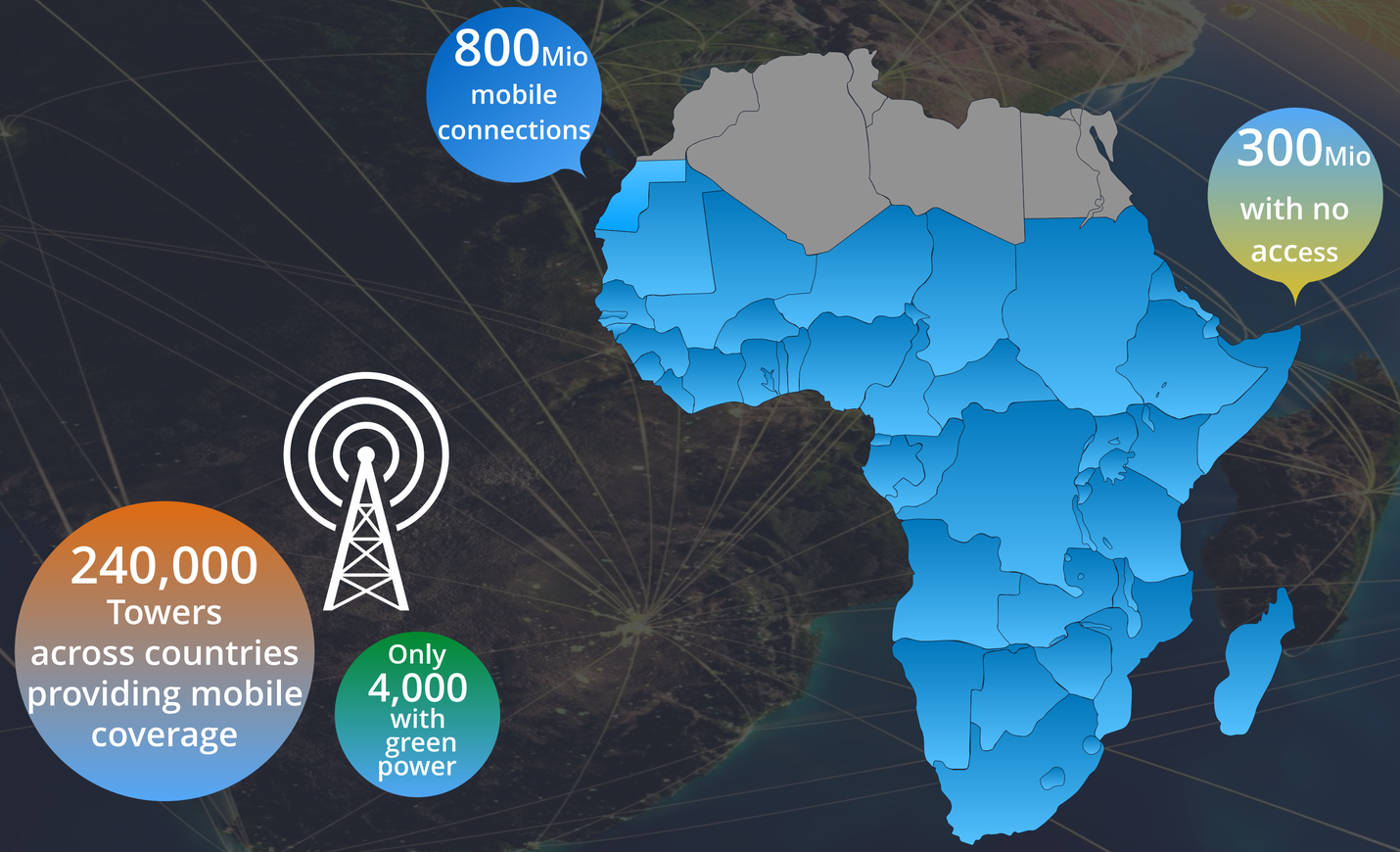
Business and Industry Analysis

1.1 Africa's Telecommunications Bottleneck

The mobile telecommunications industry in Africa is in a transitional phase with changing industry structure and dynamics. Africa currently has over 800 million mobile connections and nearly 450 million unique subscribers. The coverage of mobile network has varying range from 10% to 99% across countries in Africa with an average of 70% mobile coverage. Despite the huge growth and potential future opportunity, the mobile industry in Africa faces many challenges – both infrastructural and operational.

1. The mobile operators face challenges to power their existing networks, both off-grid and on-grid, because of unreliable power supply and heavy reliance on expensive diesel power to power up their existing networks.

2.The mobile operators face infrastructure challenges to expand mobile coverage to uncovered populations (the majority of which live in rural and remote areas without access to grid electricity and road infrastructure) owing to higher operational costs and poor ROI.



Business and Industry Analysis

1.2 Africa's Telecommunications Bottleneck

The mobile networks in Africa have grown beyond the reach of grid electricity and mobile operators have deployed a significant part of their tower infrastructure in areas without any access to grid electricity infrastructure. According to Phenecia AG's analysis and estimates, Sub- Saharan Africa has a total of over 240,000 towers across countries providing mobile coverage to 70% of the region's population. The size of the tower portfolio is expected to grow to over 325,000 towers by 2020. Majority of telecom tower sites in Africa are deployed in either off- grid areas or problematic grid areas with unreliable power supply. Africa currently has an estimated 145,000 off-grid sites which is expected to grow to 189,000 sites by 2020. The number of bad-grid sites is expected to grow from 110,000 in 2014 to over 140,000 sites by year 2020.

Energy costs constitute a major chunk of network OPEX for mobile operators in Africa. For a typical tower site in Africa, the share of energy cost is as high as 40% of the overall network OPEX. An off-grid site consumes nearly 13,000 liters of diesel every year, at an average annual energy OPEX of over $21,000 and adds nearly 35 metric tons of CO2 emissions to the environment. An unreliable-grid site consumes around 6,700 liters of diesel and produces 18 metric tons of CO2 emissions to the environment. Further to the above costs of diesel power, there is an additional 10- 15% cost due to diesel pilferage, which is very common practice in many countries across Africa. Africa has huge renewable energy resource potential to be exploited. However, with its imminent challenges, the mobile industry in Africa is far from capitalizing on its tremendous potential presented by green power alternatives.

Africa currently has a total of less than 4,000 sites deployed with green power alternatives. Limited investment capital, dearth of sustainable business models, lack of impetus from government and regulators, limited collaborative efforts within the industry have handicapped the scaling of green power alternatives in telecoms across Africa. The changing industry structure has also greatly impacted the pace of green adoption over the past few years.

However, the mobile industry in Africa faces many challenges – both infrastructural and operational, to operate the mobile networks in a cost-effective manner. The abysmal grid electricity infrastructure is one of the major challenges in running the networks and adds a significant cost to operations. Limited grid electricity infrastructure combined with inadequate electricity supply capacities has forced mobile operators to rely on alternative power sources, such as diesel generators to power up their networks – both on-grid and off-grid. The reliance on diesel based power alternatives has hugely increased the cost of operations for their existing networks due to the higher cost of diesel power, the regular maintenance of power equipment and diesel generators.

Business and Industry Analysis

1.3 The Market Size and Potential

Africa is one of the fastest growing regions in the world, with a forecasted real GDP annual growth rate in 2017 of 5.5%. Over the next decade aprox. 100 milion more people are expected to join the African middle class.

•Africa has grown at 8.7% CAGR in real GDP terms between 2005 and 2015, making it the second fastest growing continent in the world, only behind China-propelled emerging Asia.

•Part of this rapid GDP growth relates to improved international trade and an accelerated pace of foreign direct investment, in particular from emerging super-powers, such as China and Brazil. Many major multinational corporations invest in Africa, both in natural resources, infrastructure, goods and services. However, there are impediments to growth – road, rail infrastructure and power can be scarce, political instability and corruption are still widespread, regional integration is progressing only slowly but all these elements are improving and making long-lasting impact. Operators in growth markets can look forward to revenue pools increasing by 50 percent in the next five years.

Demand estimates and Projections
The International Energy Agency (IEA) estimates that electricity demand in the region grew by about 55% from 2006 to reach 492 TWh.

Currently, average per capita electricity consumption in sub- Saharan Africa is 488 kWh each year, the lowest rate of any major world region. By comparison, in North Africa, where the electricity access rate is over 90%, electricity demand increased by more than 80% from 2006 to 2016 reaching 1,900 kWh per capita. The greatest demand in sub-Saharan Africa is in Nigeria and South Africa, which together account for about 40% of total demand (IEA, 2018).

McKinsey's power sector report on sub-Saharan Africa estimates electricity demand at 623 TWh in 2016 and also projects an annual growth rate of about 4% through 2040 (Castellano et al). Discrepancies in estimates of historical electricity demand, particularly owing to unreliable data on captive power and self-generation, add to the uncertainty of demand projections, which are so important in deciding the future design of the region's power system.

Although Sub-Saharan Africa consumes less electricity than Brazil, by 2040 its demand will reach a level equal to 2010 consumption in Latin America and India combined.

INDEPENDENT POWER PRODUCERS

Electric utilities in Sub-Saharan Africa are typically vertically integrated—that is, they control all levels of the supply chain: generation, transmission, and distribution. However, because of the poor performance of the power sector in the region many countries have attempted to unbundle their electricity utilities to allow participation by independent power producers (IPPs). IPPs are entities, usually private, that generate and sell electricity to utilities and end users. Ghana, Nigeria, and Uganda have had some success in this area. Nonetheless, as of 2014, 21 countries in the region still had state-owned and vertically integrated utilities with no private sector participation, precluding IPPs. Some countries remained vertically integrated but still introduced IPPs. Currently 18 Sub-Saharan countries have IPPs with a cumulative capacity of 6.8 GW. These IPPs range in size from a few megawatts to 600 MW. The overwhelming majority of IPP capacity (82%) is thermal and 18% is fueled by renewables. The presence of IPPs can help reduce the perception of risk in investing in power systems in the region and encourage private investment. To succeed, IPPs require favorable local investment climates, clear policy and regulatory frameworks, local availability of cost-competitive fuels, and effective planning, procurement, and contracting practices (Eberhard et al., 2016).

SELF-GENERATION

Installed capacity estimates in the region are appallingly low compared with the resource potential, and the situation is even worse than those estimates indicate. Installed capacity and grid presence does not guarantee that people have access to electricity. In Nigeria, for example, abundant fossil energy potential and the development of petroleum-producing infrastructure have not increased reliable connection to the electric grid. Sub-Saharan Africa's inability to provide reliable electricity has led to the prolific growth of inefficient and expensive on-site self-generation by industrial, commercial, and even residential consumers, reaching up 10% of the region's generation capacity. This has increased the cost and risk of doing business in Sub- Saharan Africa. Lack of reliable electricity has resulted in economic losses of about 2% of the region's GDP and about 5% of annual sales of its firms (Castellano et al., 2015). In Nigeria, 85% of firms use a back-up generator (Cartwright, 2015). These back-up generators are expensive, costing about 300% more than electricity from the grid (Foster & Steinbuks, 2009). This prolific use shows the region's appetite for electricity and willingness to pay for it.

Business and Industry Analysis

1.4 Opportunity and Challenge

25 years to progress

We forecast that electrification levels will only reach 70 to 80 percent by 2040 given the challenges associated with getting the power to where it needs to go. Our research found that it takes on average 25 years to progress from a 20 percent electrification rate to 80 percent electrification rate, our research found. We know there will be demand, what about supply?

Second-highest growth rate

The next chapter of telecommunications will be defined by exploding data demand. A huge potential will be captured by operators who, by making smart investments in the core business of connectivity, will become intelligent network operators. A region represents 8% of the global telecommunications market and has the second-highest growth rate of any region.

Economic development

Electricity consumption and economic development are closely linked. Growth will not happen without a step change in the energy sector.

The Opportunity is great but so is the Challenge

Anyone can hold the helm when the sea is calm.

There's no such thing as a challenge too big to handle. We see the opportunities in every difficulty rather than the difficulty in every opportunity.

We will master this challenge together with you!

Winning in the data age

Growth markets possess the greatest remaining opportunity for increased penetration, though their low per-capita GDP. The outlook for the telecommunications industry is very strong, as consumer demand for data grow exponentially but growth will not happen without a step change in the power sector.

Electricity gap and infrastructure

To achieve full electricity access, sub-Saharan Africa must rely on a combination of many pathways and strategies, such as synergies between centralized and distributed energy systems. Where should supply come from—fossil fuels or renewables? What scale of infrastructure should be deployed to reach unconnected populations—centralized grid extensions or distributed systems?

Traditional distribution grids

Only seven countries in Africa currently have electricity access rates that exceed 50 percent and there are currently 625 million people living outside the reach of traditional distribution grids

The challenge we are faced with, therefore, is to summon the will to meet the energy challenges with the most pioneering solutions. The struggle for energy across Africa is not comparable with other nations, therefore we should not be constrained to the solutions sought by such other nations. We should favor sustainable solutions over imitating the outdated modes of generation that will become a future burden. And, we should favor more agile micro-level modes of generation, which can meet the needs in months, over behemoth projects that will take generations for their effects to be felt.

Africa's problems will not be solved by a reliance on massive, load- bearing generation plants. They take a long time to bring on-grid, cost an astonishing amount of money to construct and rarely benefit the rural and hard-to-reach communities that need them the most. Many still regard off-grid power provision as a stop-gap measure, designed to bridge the gap until on-grid electrification has been achieved. But with on-grid development moving at a glacial pace. The technology for creating micro-grids (which is to say a series of houses or businesses attached to a small generation source off or at the edge of the grid) is becoming easier to implement and more reliable to run. Hours of sunlight power homes in the day, efficient storage of the excess provides electricity in the night. What's more, the reality is that almost all Africans could have access to clean, abundant and virtually-free electricity within the next decade. The supplementary bonus here is that countries, villages, even individuals, can grow their economies immediately without the time and expense of permanent generating capacity.

The provision of power to a population is not simply an economic conversation, but rather a humanitarian one. For most, electrification does not mean running a refrigerator or television but providing heat and light from a source that does not fill a home with dangerous fumes, or charging a cell phone from which payments can be made, phone calls received and even news reports read. Providing electricity to homes means healthier families, better educated children and optimising financial inclusion to capture those in rural areas.

Now Africa faces a fork in the road: either commit to the well-trodden but impractical road of centralized electricity generation, or chart out a pioneering path toward alternative energy solutions. It is in this latter option that we believe can truly change the fortunes of our continent. For all the problems that infrastructure deficiencies have presented to Africa, it is in many ways a mixed blessing. Countries around the developed world are themselves hesitantly exploring options for transitioning towards a carbon constrained future but each faces the enormous hurdle presented by replacing or adapting the legacy infrastructure upon which their power provision relies.

We believe the real opportunity for Africa is to demonstrate to the world the impact of small-scale, blended renewable energy sources at a micro-grid and mobile level.

Business And Industry analysis

1.5 Mastering The Challenge

THE POTENTIAL OF DERs

DERs have many advantages over centralized grid systems, such as reduced power loss, scaled design, and suitability to renewable sources. In particular, DERs have the potential to alleviate the social inequalities reinforced by decentralized grids. This intraregional electricity gap perpetuates inequality by hindering the welfare development of those who are currently poor. DERs in the form of micro-grids have the potential to bypass this challenge and rapidly deliver power to communities without grid access.

01

DERs are waiting on the right mix of catalysts, such as cheaper battery costs and smarter ICTs, to drive unprecedented growth and deployment.

THE POWER OF DECENTRALIZED ENERGY TECHNOLOGIES

Strategies for deploying renewable electricity in off-grid areas include the use of solar lanterns, solar home systems, and solar micro-grids. To cope with intermittency, solar and wind micro-grids are often built as hybrid systems with natural gas, biogas, or diesel. As the cost of energy storage declines, renewable micro-grids can become the sole source of electricity in both grid and off-grid areas.

02

DERs and smart grid

With the advent of smart grid technologies, Africa has the opportunity to make its grids receptive to DERs, taking pressure off of centralized generation and increasing overall grid reliability. DERs allow remote communication and maintenance, easy data analytics, and smart metering. DERs will drive unprecedented growth and deployment. To outpace the region's growing rate of electricity poverty, the decentralized mini-grids solutions must be deployed in tandem and synergistically.

03

Micro-grids can become the sole source of electricity in b grid and off-grid areas.

Micro-grids

A micro-grid is a small-scale power generation and distribution system that delivers electricity to multiple buildings in a village. Micro-grids can provide electricity to even remote sites because innovations in ICTs enable demand forecasting and pay-as-you-go services. Also, microgrids do not require large investments and long construction times—although the capital costs are still prohibitive for small and medium-sized entrepreneurs. They have the capacity to reach the remotest regions.

04

Reduction in CO2 Emissions

A 60-70% reduction in CO2 emissions by way of adopting green power alternatives for telecom towers would result in an annual OPEX savings of nearly US$ 23,000 per site. This presents a huge opportunity for mobile operators and investors to positively look into green power as a viable alternative to power mobile telecom networks. Nevertheless, we forecast that electrification levels will only reach 70 to 80 percent by 2040 given the challenges associated with getting the power to where it needs to go. It takes on average 25 years to progress from a 20 percent electrification rate to 80 percent electrification rate, our research found.

05

Business and Industry Analysis

1.6 Responding to Africa's Energy Needs

Our goal is to generate energy for sustainable, equitable development and accelerating telecommunications and the digital economy growth and access to greenpower for all. In "Electricity Beyond the Grid" we look at the opportunity to rapidly accelerate momentum towards universal energy access. Nearly one in five of the world's population donot have access to electricity. Based on current trends, two-thirds will remain without electricity by 2030, which is the target year to achieve the newly agreed Sustainable Development Goal of universal access to energy. While the Sub-Saharan African power sector faces many challenges, there is real momentum for change. Success will propel economic growth of the continent and greatly enhance the lives of hundreds of millions of people, as well as potentially create a thriving electricity-supply industry and an associated 2.5 million temporary and permanent jobs across the continent.

A cooperation of area independent Companies, combining:

1. Energy "Energy Towers GmbH"
2. Telecommunications "Nynex/FiberONE"
3. Financial services "Phenecia AG"

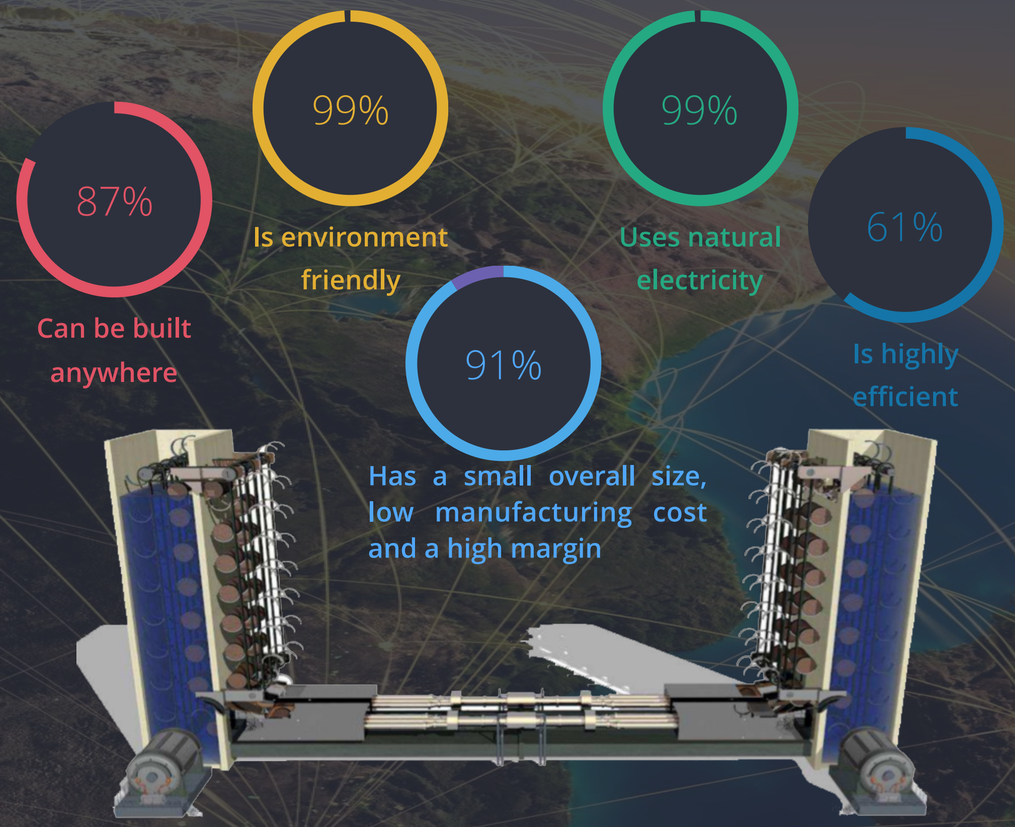
4. Biogas plants Expert "Bioconstruct"
5. SME/Industry/Engineering specialist "GBZ" / "Hänchen"
6. The University Karlsruhe Institute of Technology "KIT"

Equipped with a new Revolutionary Technology and encouraged to help Africa develop rapidly.

ENERGY TOWERS

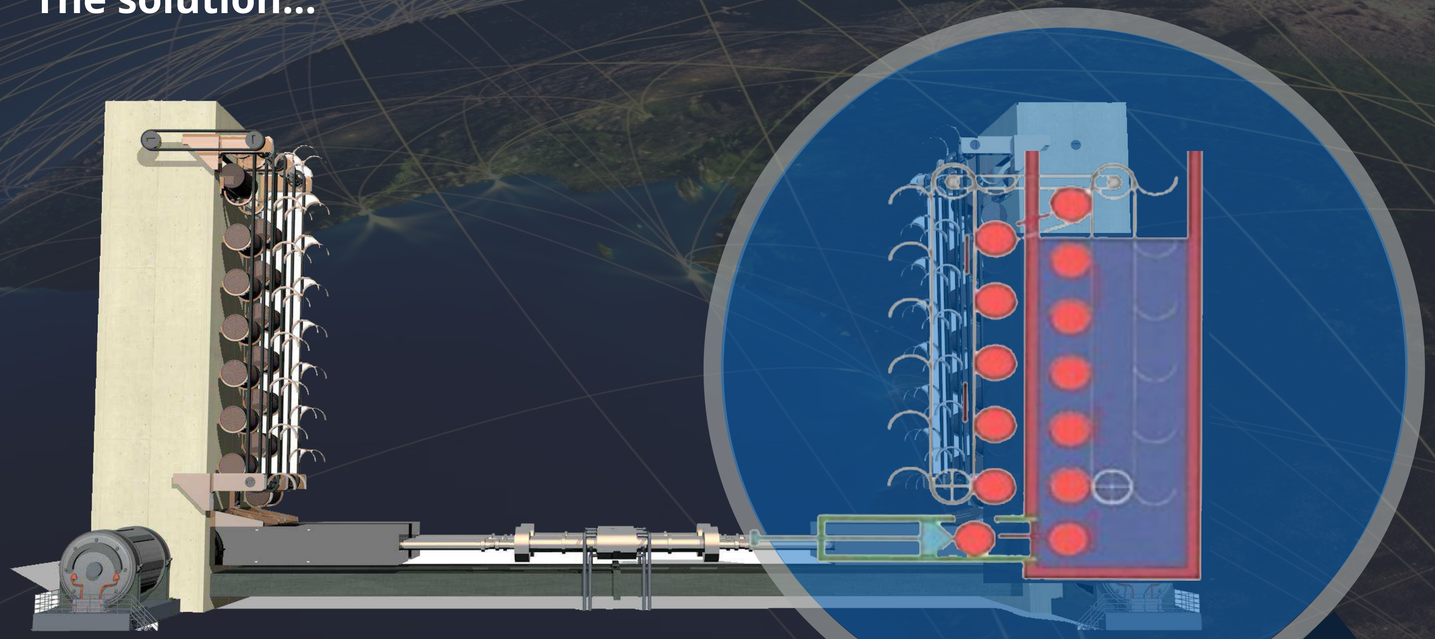
Energy Towers GmbH have the patent for the Buoyancy technology, which is a new procedure that efficiently produces electric current. The technology's technical feasibility has been proven in theory by the KIT, the "proof of concept" that demonstrates its practical potential through test-systems is taking place on 01.09.2018. Systems built based on the buoyancy technology would come in different overall sizes and power steps (5, 10, 25, 50,MW). Due to their small overall size, the systems can be built and implemented at almost any location around the world. For example, 48 of 25 MW systems would be able to substitute KWU (1.2 GW). Energy towers of the sizes 15,20, 50 MW have the capacity to supply a village, a town, or a region. In the long term, these systems could substitute most of today's heating systems in the private sector. While the principle is reasonable, very efficient, and proven in theory, the test systems proving the functioning of these systems must still be built. The "Proof of Concept" has been approved by the KIT University. As soon as we are able to conduct the "Proof of Work", where the principle and the economic efficiency could unambiguously be proven, we will launch an economic study with extremely interesting commercial models.
This technology has the potential to solve today's worldwide energy problem.
Thus, all KWUs could be switched off worldwide in the medium term through adapting the current electric KWU infrastructure with the buoyancy technology instead of nuclear energy. Therefore, a complete redesign would not be required.

We are very confident about the potential of a successful application of this technology developed by Mr. Akbayir and decided therefore to join this amazing project in Africa.



We need an energy generation which can be used site- independent and which is invariably base-loadable. The search for a physical natural force, which is at any place and always with constant and never ending power present. And this independent from sun, wind or hydropower.

The solution...



1. A conveyor system with several floatation panels in a tower filled with water will be driven by the buoyancy of the floatation panels.
2. A second conveyor system, outside the tower, transports the floatation panels back from top to down.
3. A special procedure transports the floatation panels through a sluice back in the tower. This sluice can be operated for example by burning of natural gas.
4. At an impeller of the conveyor system there is energy (power) generated by a generator.

The well-known Karlsruher Institute for Technology (KIT) has calculated for this kind of power plant an efficiency of > 60%.

With a special patent applied procedure and device, it has been successfully managed, to neutralize largely in the system's existing pressure. The energy input for the insertion of air or gas filled floatation panels is only to limit on the losses of the frictional forces in the entire system.

At its core, "Buoyancy" is an efficient electric current producing technology. The energy tower works in the form of a cycle. It is filled with liquid and contains two rotating conveyors, one inside and another outside the tower, that transport cylinders from the top to the bottom of the container and vice versa respectively. One of the traversing wheels is connected through a drive shaft to the power producing generator.

Business and Industry Analysis

1.6 Responding to Africa's Energy needs

We need energy as a current. Energy is a base for high standards of living, all economic activities and the mobility of our society. Our traditional energy supply today is heavily based on fossil fuels, such as coal, oil, natural gas as well as uranium. Since these energy sources are limited and scarce, and have negative implications on the environment, such as pollution, and the inconsiderable carbon dioxide (CO2) emissions, a groundbreaking change is necessary. Nuclear power plants, brown and coal power stations are laid out for continuous operation and are rarely interrupted, although the other sources of energy have also proven to have limitations and inefficiencies. Renewable energy power stations often do not produce evenly, as wind and solar irradiation are not available at any time. Hence, they reach a clearly lower full load utilization period per year.

Water power is a dependable and "always" available energy source. Therefore, water power plays an important role in future innovative renewable energy research. With it the hydroelectric power plants produce stream when wind and PV systems do not, partly due to weather conditions and/or the time of day.

In contrast, gas power stations are able to use coal-fired power stations to quickly adapt to achievement variations and can be pursued on account of the lower capital costs and perceived economically with lower company hours. Gas power stations are the suitable partners of the renewable energy for future electricity supply.

Gas power stations, in contrast to coal-fired power stations, are able to react very fast; adapt to achievement variations; can be pursued on account of lower capital costs; and economically superior, using less company hours. Gas power stations are the suitable partners of renewable energy for future electricity supply.

Biomass is stored energy that can be used timely and spatially depending on demand. Its current production is adjustable and can thereby be used to supplement todays power plants, for example by wind stream. The energy of biomass, above all fermentation gas, is able to produce peak loads of energy. A big disadvantage of biomass is the surface consumption of the cultivation cultures for fuel. Hence, also in future security of energy supply, affordability and environmental compatibility, a well- balanced energy combination is not foreseeable under these factors. A judgement of the costs of the different energy sources strongly depends on whether external, i.e. hidden costs are considered and balanced, such as greenhouse gas emissions, environmental damage and health defects.

Profitability Calculation of the Energy Towers

Medium of Energy	Full load hours (average)	Efficiency (in %)	Costs per MW / US $ million	Turnover per MW / US $
Photovoltaics	2.000	13	1,4	300.000
Natural gas power	2.500	28	-	375.000
Wind energy on	2.400	32	1,6	360.000
Offshore-Wind	3.700	49	-	555.000
Biomass power	4.500	60	-	675.000
Energy Towers	8.000	61	0,75	750.000

Energy towers profitability calculation in detail:

1,2

ROI in Years

672.000 US$

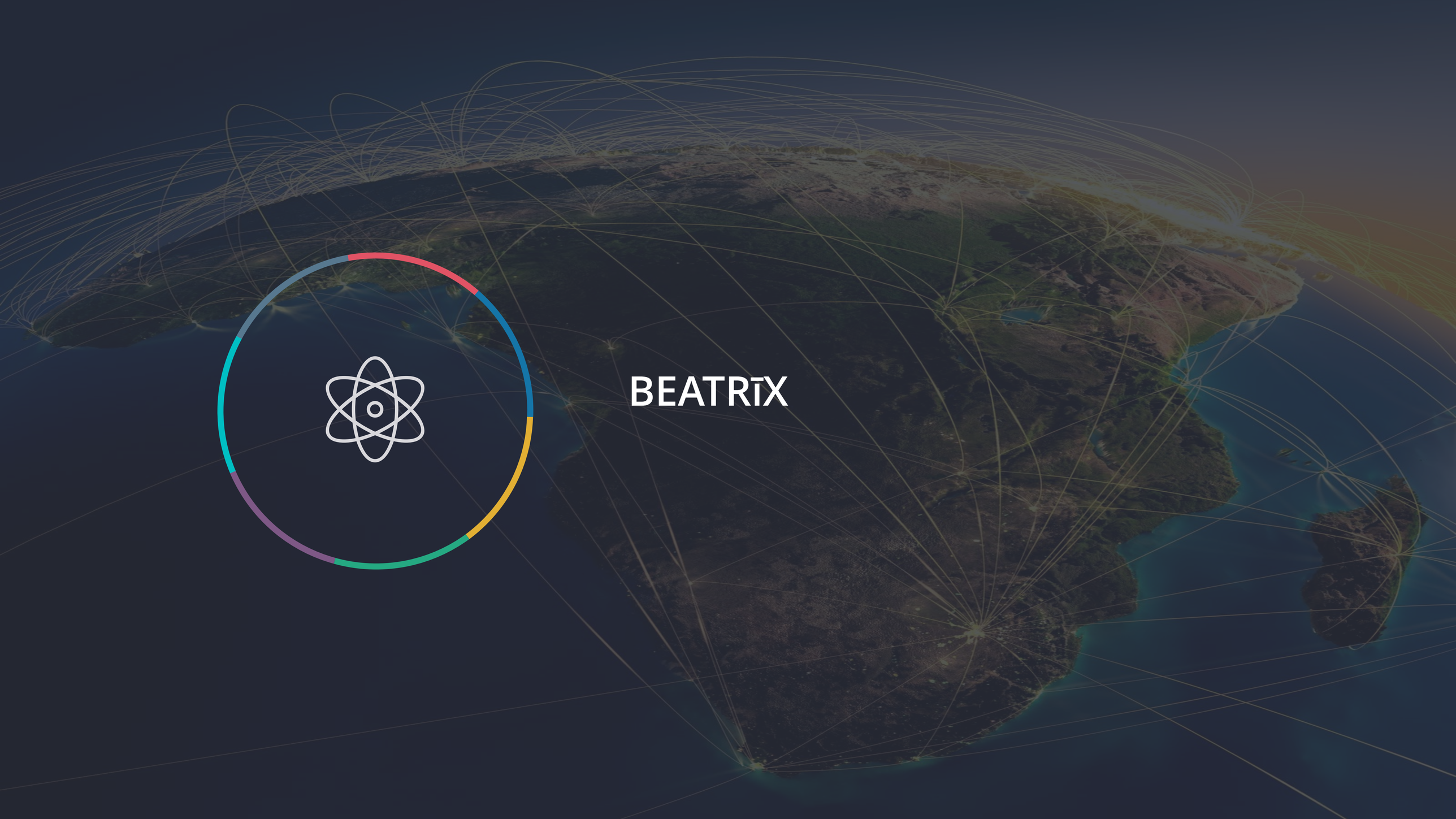
Yearly Revenue

Investment 1MW $750.000

Costs Biogas/Maintenance for 1MW per year $128.000

Turnover 1MW x 1000kWh x 8000hrs x $0,1 = $ 800.000

Income $800.000 - $128.000 = $ 672.000


BEATRIX

BlockchainedEnergyAndTelecommunications +RĪX as the Token Name

The name BEATRĪX is a girl's name of Latin, Dutch origin meaning: "she who brings happiness”. Beatrīx will provide green, low cost, sustainable energy and telecommunication to people who need it most in Africa!

The main and only focus of our project is Africa, which is where we will stay until we become a market leader.

There are significant barriers to the further implementation of renewable energy that need to be addressed.

The key issues include the following:

Many renewable energy technologies remain expensive, on account of higher capital costs, compared to conventional energy supplies for bulk energy supply to urban areas or major industries. Implementation of renewable energy technologies needs significant initial investment and may need support for relatively long periods before reaching profitability.

The good news is that attaining sustainability is still possible, that is where ingenuity, innovation, and education comes in. We just need to combine our genius and common sense for a sustainable green future. Now is the right time to do it!

Abstract:

There is a strong need to develop a viable independent power industry that serves the public interest by providing cost-effective electricity through the environmentally responsible and efficient development of available energy resources.

Our objective is to highlight the Decentralized Energy and Telecommunications Distribution (DETD) technology in term of need, types of DETDs, features, deployment barriers, applications, drawbacks, challenges, etc. DETDs are not only simple power sources for telecom or other applications rather helpful in keeping environment as clean and green. Similarly, we can use the term “Green Telecom” while using DETDs in telecom applications.

The energy industry must be involved by switching generation sources to more sustainable sources and working with customers to help them use energy more efficiently. The Green Telecom theme is to promote carbon accountability in the telecom industry. The demand of renewable energy for environmental concerns has been increasing rapidly. The Energy Technologies are readily available in the market but there are some issues and

The power of going small is the answer to Africa's energy problems

Despite impressive economic development in recent years, Africa still lags far behind on energy, with almost two-thirds of the continent’s citizens lacking access to electricity. While getting more power to the people is an important goal, extending electricity grids is expensive and slow. Meanwhile, off-grid options may not be sufficient to meet people’s energy needs. Fortunately, there is a third approach that can help fill in the gaps: Micro-grids through the DETD's .

Access to power

DETD's can ensure that consumers retain access to power when the grid suffers interruptions. Despite these benefits, the potential to help overcome Africa’s energy challenge.

Global energy transformation

DETD's will play an important role in the way electricity is generated and distributed, providing modern energy to millions of people, while placing the continent at the forefront of a global energy transformation.

Energy Towers Micro grids

Micro-grids are essentially localized electricity networks that supply several users, whether households or businesses. They can be grid-connected, but also do not have to be. DETD's can have a major competitive advantage over grid extension in rural and remote areas, because they can provide electricity more quickly and at much lower cost. Because they require less capital investment than grid expansion, it can be easier to secure financing for them, meaning that they can electrify communities that might have to wait years for a grid connection.

DETD have a distinct advantage

over off-grid systems: greater power generation. Moreover, they can be used to increase the resilience of existing electricity systems. Power cuts on the main grid can affect a large number of businesses and households, and it can be difficult to restore services quickly.

BEATRĪX

2.1 “She Who Brings Happiness“

Awareness

With Energy comes Telecommunication.
Modern economies and societies cannot exist without electricity.

The Future of Subscriber Growth in Africa

- lower call prices and lower overall cost of ownership for handsets, allowing penetration of lower income segments
- better network coverage in rural areas and operating models adapted to serving such remote connectivity needs
- mobile data connectivity (as well as M2M), which has already proved successful in a number of African countries (e.g. SA)

The Digital Transformation

Responding to the growth in demand for high-performance telecommunications infrastructure and improvements in operating cost and energy efficiency as the signal processing base band services for 4G networks, fibre optics, cell phone coverage, cloud and more, coming from private individuals, companies and local authorities is decisive, because we want Africa to overcome one of society's greatest challenges: the digital transformation.

Gas Utilisation for the Energy Towers

Due to the need of gas for the energy towers (approx. 20.000$ per year) we planned a “Partnership and Cooperation” with one of the best on the European biogas market, BioConstruct plans, builds, and maintains individual AD-Plants for farms and agricultural purposes as well as medium-sized communal plants and industrial waste treatment plants (waste to energy). The Energy Towers, in particular, benefit from a biogas plant, the gas generated from solid manure, liquid manure, grass and energy crops can be directly used for the Energy Towers.

Electricity to the People Who Need it Most

Delivering electricity to Sub-Saharan Africa’s rural communities, and areas where only limited grid exists, in which the communities are left with limited options for electricity access and can not afford the relatively expensive connection fees.

Biowaste Separate Collection

Composting allows saving natural resources by transforming biowaste into a product, reducing harmful impact of chemical fertilizers to soil. The way to transforming waste into ready available compost. Biowaste collection is feasible even in poor countries as compost market exists and is growing.

Decentralized Energy and Telecommunications Distribution

BEATRĪX will open up a production factory on site supported by an EPC Company (Engineering, Procurement, Construction) will develop, deploy, build up and extend the Energy Towers in the planned and needed areas.

Foreigners as well as locals are going to manage and maintain the system through the process from energy generation to payment.

Unlike the centralized grid systems in Africa BEATRĪX’s Decentralized Energy and Telecommunications Distribution (DETD) via Micro-grids plan has many advantages.

DETD

DETDs have the potential to alleviate the social inequalities reinforced by centralized grids and to bypass this challenge and rapidly deliver power to communities without grid access.

Rural communities

Existing grids in Sub-Saharan Africa favors only wealthier communities, DETDs will be able to provide electricity access to the rural communities.

Powering Mobile Networks

DETDs will reduce the costs of Powering Mobile Networks. Energy costs constitute a major chunk of network OPEX for mobile operators in Africa. The limited, availability and reliability of electricity supply plays major role in the cost of powering telecom tower sites, energy costs is as high as 40% of the overall network OPEX.

DETDs are capable of supplying reliable and modern levels of energy services, while grid extension is too slow and expensive to reach the millions of people without electricity.

Composting

Composting is a good option for treating biowaste collected separately at households, central markets, supermarkets, rest homes, restaurants, municipal gardens.

Flexible

DETDs are flexible in other ways, they may or may not be connected to the national grid. They can be operated privately, by utilities, on a community basis, or according to a public-private model.
They can sell electricity to retail consumers, utilities, or both.

2.2 The BEATRĪX Platform

Opening the Bottleneck

1

BEATRĪX opens up the energy and telecommunications bottleneck in Africa, by using the Blockchain technology solution, Smart "Decentralized Energy and Telecommunications Distribution " (DETD) Contracts technology for the RĪXPowerMeter(RPM) prepayment and one of a kind trading and investing platform.

Payment

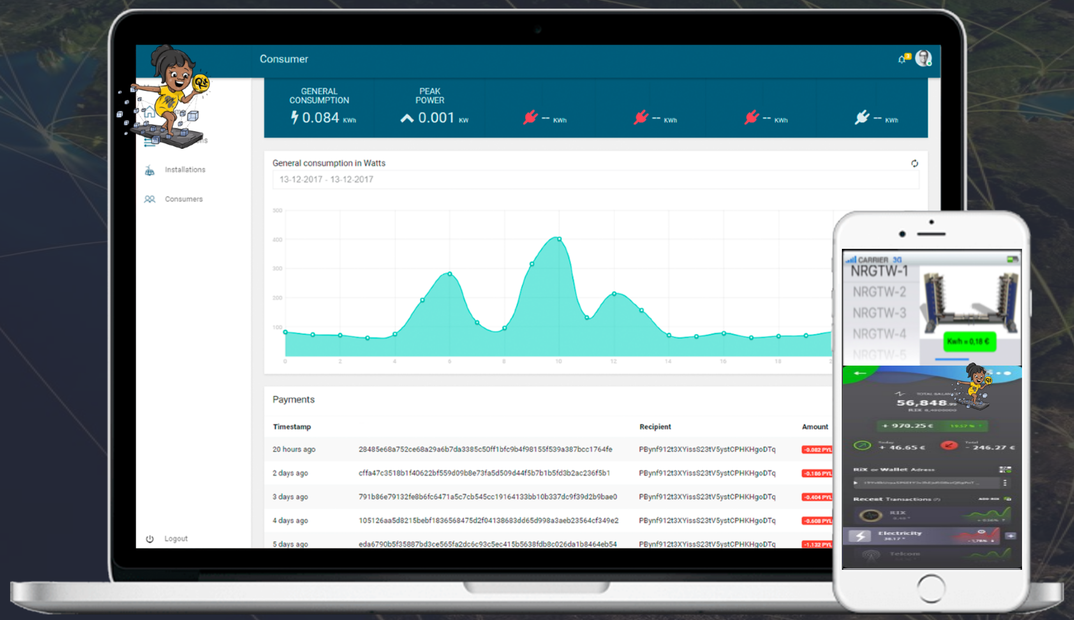
2

The sole digital currency accepted on the platform. The people in rural areas have to pay much more for electricity than in urban grid- connected areas, that is not our objective neither our plan. BEATRĪX is going to provide electricity to people in rural areas for far less than else where to help these areas develop much faster.

Telecommunications Payments

3

Will provide the possibility to settle bill payments with the RĪX over the platform.



Consumers

4

Using their mobile devices and local fiat, consumers will purchase the RĪX- Token from the platform to pay for Electricity/ Telecommunication services, in a "prepaid" system, much like the way they pay for their minutes or data from the local telecom today already.

Most of the people in Africa are unbanked but the access to mobile phones and mobile payments exist at present time but mobile payments for electricity are not the standard.

Access

5

The BEATRĪX platform will be accessible through a Web-based solution software for Mac and PC computers and apps for Android and iOS devices.

2-factor Authentication

6

Uses 2-factor authentication so nobody other than you can access your account.

RĪX Tokens

The BEATRĪX platform will have the functionality to display and transact with RĪX Tokens, the sole digital currency accepted on the platform.

Link equipment

The BEATRĪX platform is able to link customer's equipment. The system allows superior customer service based on real-time data. For example, proactive alerts can be issued to customer service agents instantly to track problems before they evolve.

Smart Design

It supports payments in ways that benefit both the customer and the provider. The systems have the ability to remotely turn off the equipment if monthly payments are not made and to switch them back on again once payments resume.

RĪX holder and Trader

We also want to develop an advanced option of the BEATRĪX Platform for RĪX holder and trader, to be able to take advantage of the RĪX energy auctions that are going to take place every time when a 1 MW DETD is built and activated.

This will make it possible for the trader of the RĪX to have the most advantage of price changes depending on demand and supply.

Basic / Advanced Mode

Allows anyone in the world to invest, trade and energy-consumers to purchase the RĪX, which offers a basic mode for user, consumer, seller , and an advanced mode for Trader.

“RĪX Smart Contracts“(RSC)

BEATRĪX SEC solution allows fully transparent energy trade accounting, with future flexible energy trade in a form of RSC. Each of these contracts is a power purchase agreements built on the Ethereum blockchain and represents the amount of energy that a DETD is going to produce in the future and how that energy is distributed between energy consumers, buyers, investors and traders. They can be used to offset energy bills, traded on the marketplace or sold into the energy wholesale market once the energy is produced or even before. This is achieved by linking digital contracts with DETDs data on blockchain.

Energy that will be produced through the DETD and traded on the BEATRĪX platform will be assigned to the RĪX tokens and stored in the RSC, transforming the RĪX into Real asset “energy“ based tokenized units. The RĪX holder can use this energy for their own purposes or trade it on BEATRĪX platform, at any time of his disposal. This ensures liquidity option for contributors from the first day.

Many companies that cannot invest in their own solar panels or wind turbines purchase green energy credits. These credits represent the renewable energy resources associated with power production. When they are certified, they are eligible for renewable energy certificates (RECs). The credit can be sold, bartered or traded and the green energy credits represent the source of the energy produced. That is what the RĪX is also going to present because of energy assigned to it through green energy production.

What is the RĪXPowerMeter(RPM) :

The RĪXPowerMeter(RPM) will alert users when they are about to exceed their RĪX Credit balance and a need to reload the account. If the account is depleted, the RĪXPowerMeter(RPM) will stop the flow of electricity until the users’ RĪX Credit balance is sufficient. The consumer of the power accesses the RĪXPowerMeter(RPM) and data on the blockchain to make a payment from his or her mobile device. The RĪXPowerMeter(RPM) can connect to the internet through whatever connections are available—GSM, WiFi or a mesh network creating a local ISP.

RPM are electronic devices that record consumption of electric energy in intervals of an hour or less, and communicate that information, at least daily, back to your utility. This relatively simple technology shifts the way your energy consumption is measured quite drastically. Instead of you reporting your energy usage every month to your utility company, and then getting billed based on an estimated energy cost, with RPM, your utility can calculate your real energy use on a daily basis and bill you based on the energy price for every given day or hour.

All energy generated within an DETD will be managed through the deployment of RPM, which will accurately monitor the entire process from energy generation and consumer usage through to payment. The RPM also provides a valuable feedback loop: it creates a transparent transaction on the blockchain from which we can collect data about consumer’s habits in order to optimize their interactions with the network.

What are the advantages of using a RĪX Power Meter (RPM)?

-RPM is a prepayment meter suitable for both domestic and commercial consumers. The meter contains a calibrated measuring device, which assures the correct usage of electricity dispensed from the main supply.

-It is user friendly, no meter reading, no monthly bills, no billing discrepancies, no inconvenience of disconnecting and reconnecting service.
-RPM empowers you to use any of your appliances at your convenience and you can buy any amount.
-There is no expiration period for units purchased but not used. -With RPM, you are always in total control of your consumption.
-RPM provides a better understanding of how the consumer uses energy and helps us find ways to optimize our usage habits. Doing this can save money on your energy bills.
-RPM helps manage the system better and thus lower energy costs as well as identify system malfunctions much faster and fix them before the system fails.
Another approach for the RPM is to have a predictive-analytics/AI/data stack many apps can use to automatically turn things on or off in anticipation of use, store energy at night, charge batteries quicker, and much more. An ecosystem like this has the potential to vastly increase our energy efficiency without increasing the head count needed to run it, because the blockchain and smart contracts do most of the work, which will reduce costs and increase innovation. To incentivize people to save energy, produce and sell energy, and create new applications that don't exist today. The smart meter communication service is a critical part in our DETDs project. We are going to install smart meters in million homes and small businesses over the next years. The rollout of smart meters will be the catalyst for the most significant and innovative changes to the energy sector since Privatization.

BEATRĪX is going to implement a brand new, highly secure network to support data communications with these smart meters. The network connects the smart meters to BEATRĪX's DETDs within the platform, distribution network operators and other authorized Users, such as third party intermediaries. This allow us to remotely carry out functions such as collecting meter readings and updating tariffs and will allow the networks to receive power outage alerts. It also allows price comparison on the platform to help consumers find the best deal based on their actual energy consumption.

Combined with BEATRĪX's decentralized solution help us avoid the complexity and duplicated costs. The smart meter communication service is based on common standards to ensure a consistent service for all Users.

Benefits for consumers include:

-Managing and controlling their energy use to save money and reduce carbon emissions.

-Providing accurate meter readings and real-time information.

-Supporting the transition to a low-carbon economy while helping to ensure an affordable, secure and sustainable energy supply.

2.2 The BEATRĪX Platform

We aim to provide a power trade system that will promote a sustainable electrical energy transaction ecosystem between the DETDs, consumers, investors and traders.
A blockchain-based peer-to-peer (P2P) energy transaction platform will be implemented to enable efficient electrical energy transaction. In the BEATRĪX P2P energy-transaction platform, a RSC is embedded in the blockchain and called an energy tag. The energy tag will set conditions for making every future energy transaction more cost-efficient while maintaining the most ideal and high-quality energy selection. With the blockchain-based energy tag in the energy-transaction process, multiple energy resources and home appliances will be democratically connected in order to provide users with high-quality, low-cost energy at all times and locations. We believe that, in the long run, the BEATRĪX P2P energy- transaction platform will create sustainable energy-transaction and the expanding ecosystem will enable the development of a trusted, sustainable, secure and energy-efficient energy transaction environment. Therefore, we will present a framework with smart location-based automated and networked energy control. Smartphone platforms and cloud-computing technologies enable a multiscale energy proportionality, which includes DETDs, consumers, RĪX owner, investors and traders, and organizational-level energy proportionality.

The blockchain will be implemented to further enhance the trust, transparency and security in a distributed and direct P2P energy-trading system. We are going to run tests on the BEATRĪX energy-transaction model along with scenarios and simulation that will confirm that the suggested transaction platform will create sustainable environments for investors, traders, consumers and society. Here, we classify three major trading systems that are used in the energy domain. Energy exchange between energy domains is aimed at generating revenue for the domain and is classified as counter trade, power wholesale, and P2P transactions.

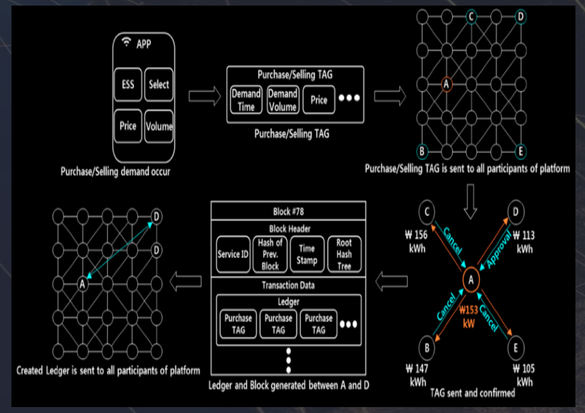
Each transaction proceeds between the specified energy domains, and the transaction target is electric energy.
The BEATRĪX platform aims to utilize a blockchain-based smart grid for the management of electricity to efficiently manage energy demand and supply in order to improve distribution networks, while regulating the consumption of energy. Additionally, the project aims to monitor and analyze electricity consumption by final consumers separately from electricity suppliers. All in all, the project's main goal is to promote a decentralized and intelligent energy production and distribution project, thereby ultimately satisfying local consumption. We will also present a blockchain-based smart grid to provide RĪX owner and consumers with a decentralized market platform. This eliminates the need for a central intermediary, creating an operational auction mechanism for small communities. The goal of the blockchain-based smart grid structure was to create a decentralized market that would be advantageous in terms of market price, while creating a secure, transparent transaction log for energy transactions.

Power wholesale is a method in which electricity generated by a DETD will be sold to the electrical power market. The billing system utilizes P2P transactions through virtual contracts of blockchain. The billing system replaces power. The P2P transaction is a trading scheme that sells power between energy domains. The transaction includes not only direct sales of electricity, but also transfers sales of energy for a certain period throughout the contract.

2.2 The BEATRĪX Platform

The BEATRĪX platform within the RSC collects data on whether an energy consumer needs to purchase more energy or if a RĪX holder is willing to sell his token. Based on the need to purchase or sell energy, a purchase or selling tag is formed, which is then sent to all participants of the suggested energy- transaction platform. The tag is then confirmed by a participant who wishes to engage in a transaction with the original RĪX owner/consumer. Then, the tag is assigned to a block, which is when the transaction becomes valid. The generation of a block triggers a ledger between the two participants engaging in direct energy transaction. Finally, the ledger is then sent to all participants in the BEATRĪX platform.

The BEATRĪX-transaction platform based on the tag embedded in the blockchain will allow for a trade that considers the current price rate of energy in each energy domain, purchase demand rate, sales demand rate, and trade object and trade protocol selection. This information is then permanent, transparent and secure, making sure that future trade decisions and tag productions are stable,



thus maintaining the constant choice of high-quality energy and low-cost energy for a more sustainable blockchain solution in Africa. The next figure illustrates an overview of how energy transactions on the BEATRĪX transaction platform are made between the seller and buyer. Energy domains are initially classified based on the current price and the purchase or selling tags for each transaction. According to the current domain price hierarchy and purchase/sale demand, the trade domain and trade protocol undergo selection.

Once the selection is made, the purchase/sale confirmation tag is confirmed by the seller and buyer, and the trade protocol is confirmed, which is when the ledger and block are generated to validate the transaction. Finally, once all the transactions are made, the block with information of the transaction is added to the chain. The following section will provide scenarios of energy transaction between different t energy domains, and an algorithm to identify what energy will be the most cost-efficient and high-quality energy choice. Based on the algorithm, we will run a simulation to compare energy- transaction results between the suggested BEATRĪX transaction platform and currently existing counter-trade platforms.

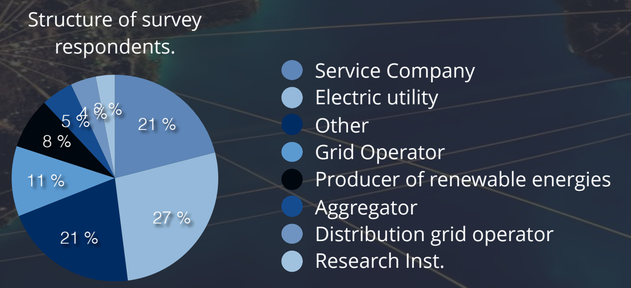
2.2 The BEATRĪX Platform

In able to understand why blockchains are part of the solution, you first need to know a few things about the green electricity market.

Renewable energy producers can sell Renewable Energy Certificates (RECs) to consumers who want to buy green energy after independent auditors assess and certify their electricity as being “green”. There are many companies like Amazon, Apple and Google who can say they are 100 precent green, even though they are not generating or using green electricity, but rather purchasing certificates from renewable-energy producers that matches up with every energy unit they consume. In fact the energy they use is not always really green. Many companies manage the most of their operations using Power Purchase Agreements (PPAs). This commits them to purchasing a certain amount of energy at a certain price from renewable-energy producers over time-scales of about 20 years or so. PPAs reduce risk for generators by guaranteeing return on investment, thus creating a strong motivation for long-term investment in green generation. A market for RECs creates a strong signal for investment in green electricity generation. Green energy is displacing carbon-intense energy but it is not easy generating green energy. The certification process for RECs is cumbersome and expensive, with physical audits, so it doesn't make sense for mom-and-pop green generators. Similarly, PPAs can only be negotiated by large green generators.

Our plan is to eliminate the cost of certification, eliminate onerous auditing and avoid non-market price controls, by using the blockchain to store generation certificates that are created by tamper-proof meters attached to our DETDs. This solution makes renewable-energy investment attractive even for small players. In our solution, smart meters attached to DETDs generating RECs, so Consumers, investors, traders, brokers and the can purchase these RECs. Indeed, since blockchain knows no boundaries, our system could allow RECs from the DETDs in Africa to recoup on the investment in green generation by selling RECs to consumers around the world. Of course, this requires placing blockchain servers in every region of the world, but this is easily done using existing datacenter infrastructure. This would reduce the global carbon footprint, and would be more efficient.

A survey among decision-makers in the German energy industry by Dena the German Energy Agency :
In a survey among German energy executives, the Deutsche Energie-Agentur GmbH (Dena) – the German Energy Agency - and the European School of Management and Technology (ESMT Berlin) have compiled their opinions, current and planned actions, and visions of the future role of Blockchain in the energy sector.
Results of the survey among German energy executives :
Will Blockchain be able to contribute toward accelerating the speed of the energy transition? What are the opinions of German decision-makers in the energy sector about Blockchain? Have they heard about it at all? Would they see any potential applications in the energy sector? Is it just hype or does it have real potential to disrupt the functioning of the industry? How big do they estimate the potential of Blockchain to be and in which areas? Will it become a niche application, or a game changer?
Responses came from executives all along the value chain in the electricity industry, starting from manufacturers to utilities, grid operators and service providers to employees at the electricity exchange.
The three largest groups of respondents were employed at electric utilities, service companies, and grid operators, respectively. The following figure shows the responses according to our classification.



WHY BLOCKCHAINING?

We have been asked this particular question many times after attending meetings, that is why we thought it would be perfect to take this as an opportunity to explain and describe the research we have done in detail, the conclusions and implications resulting in our decision-making process.

In our opinion Blockchain will democratize the energy market and bring the energy transition. Using cryptocurrencies for monetary transactions is the most obvious use case in the energy sector for making the switch to a decentralized energy system, detaching the related financial transactions from a central control unit can be interpreted as the next step toward full decentralization, we are very interested in the decentralized distributed energy generation.

With our Decentralized Energy and Telecommunication Distribution (DETDs) and the integrated Renewable Energy Certificates (RECs) within the RĪXPowerMeter(RPM), we could use blockchain to record and trade locally generated energy. This could be particularly impactful in Africa where main power may not always be available or is unreliable. These sorts of opportunities make it clear why we're interested in exploring the potential of blockchain and are implementing it in our project. With the prevalence of new energy generation and the RPMs, we could use blockchain to record and trade locally and globally the generated energy from the DETDs.

A reward system for renewable energy DETDs installations, enables its members to trade energy using RĪX Smart Contracts via Blockchain. Singularity aims to move beyond an energy exchange platform and host a range of applications, including energy data analysis and benchmarking, Smart Grid management, trade of Green Certificates, a decentralized mechanism for investment decisions, and energy trade validation. For example, collected technical and financial data can be used for real-time asset valuation of the DETD's. Other use cases include assessments of generation capacity and availability, pricing and origin, forecasting, energy trading, virtual power plants, and micro-grid management.

These blockchains also store transaction records when the certificates are traded, so that the same unit of generation cannot be resold. By eliminating auditors, transaction costs and price regulation, this solution makes renewable-energy investment attractive even for small players. Backed by Ethereum, the BEATRĪX platform as a Peer-to-Peer marketplace that matches decentralized supply and demand, taking advantage of the fact that the internet offers a much higher speed for interactions and the possibility of involving a large number of participants in real time, will essentially raise the profile of RĪX Smart Contracts. RĪX Smart Contracts are where the customer will ultimately benefit. These "contracts" are not inscribed on paper, they are coded into the blockchain with their terms permanently etched. This blockchain is a decentralized ensemble, distributed across its users, making it almost impossible to tamper with. Such contracts become instantly more secure than their paper counterparts. A peer-to-peer network will act as a consensus algorithm to ensure replication across nodes is undertaken. It will act as a distributed ledger technology of existence for billions of devices that would autonomously broadcast transactions between peers in a three-tier system of peer devices and architecture. It would show that the idea of DETDs in combination with decentralized and tamper proof data storage and backed up by blockchain technology is a valid and a successful alternative.

2.2 The BEATRĪX Platform

The Dena / ESMT analysis reveals that the cost-cutting potential of Blockchain applications has its limitations. Especially in markets where solutions already exist, the technology will have to compete with fairly efficient processes and has to prove its attractiveness to users. From a market perspective, establishing Blockchain as the dominant transaction technology might be more difficult in existing markets than in new markets where new applications do not yet exist. Electricity exchanges, such as the European Electricity Exchange (EEX) in Leipzig, serve as platforms that were established under the paradigm of liberalization to allow parties to trade energy, emissions, and their derivatives. Even though Blockchain alters the configuration of trading by establishing a peer-to-peer network, it has to compete with the existing solution. Only if its applications have tangible, monetary, or timely advantages will Blockchain-based solutions be able to convince a critical number of market participants to switch from the current status quo to the new platform, generating sufficient liquidity and establishing itself as an attractive alternative.

In BEATRĪX's and Africa's case, there is no solution that already exists and there is no efficient processes in place.
As developing country governments and donors alone are likely unable to achieve these levels of investment, BEATRĪX must be able to attract private debt and equity financing to sustain the scale of deployment required to achieve Africa's electrification. For this to happen, DETDs must be perceived as commercially viable endeavors capable of providing a reasonable return for investors, something that is typically contingent on collecting tariffs that ensure revenues cover costs and provide an attractive payback.

For BEATRĪX being able to act independently, maneuverable without restrictions through bureaucracy from government, bank, or a development bank credit, which would only prevent us from developing and expanding our project in a short time frame, we had to find a solution financing the project and still being able to move fast forward.

In our opinion, to claim victory against the Efforts of The Worldwide Global Energy Lobby to kill progress on climate change and to achieve success in bringing energy and many other beneficial goods to the people needing it most, there is no other possibility than having the majority of people behind us, to support this project.

Our idea to reward supporters generously, within the shared profit model of the beneficial RĪX discount distribution through new DETDs installations, is just a way to thank every supporter for the involvement helping BEATRĪX to reach her destination. Supporters are not only profiting from BEATRĪX's success but are also taking part of a socially beneficial project!

Code: (RĪX), is a fully ERC-20 compliant Ethereum utility token, has a fixed supply, and is divisible to 18 decimals places.

- Has an initial charge of 5 kWh per Token
- Includes access to the Voting system
- Provides priority access to RĪX Energy auctions
- Will be accepted as a deposit in a Crypto Hedge fund
- Will be accepted for telecommunication bill payments
- Can be traded on The BEATRĪX platform or various Crypto Exchanges directly after the ICO

2.3 The RĪX Token

In our opinion, Energy and Telecommunications are a more stable asset for backing a token rather than gold or debt.

Each RĪX token is backed up through energy in form of an RSC“RĪXSmartContract“.The RĪX represents a Renewable Energy Certificate (REC) that stands for a certain amount of energy that is going to be produced in the future and is owned by BEATRĪX.

If buyers decide to buy the RĪX including green energy, they buy a certain amount of RĪX energy tokens. The value of this purchase goes directly to the previous owner of the RĪX tokens. Like this, the buyer knows for certain that the energy that will be produced is owned by him and that he will get paid for it automatically by a consumer, trader or another investor if placed on the BEATRIX platform.

The electricity provided by BEATRĪX will be significantly cheaper for the consumer than conventionally used electricity, so the demand will rise and the RĪX will gain in value. The electricity price will not be affected. Example: if the value of the "RĪX" increases, the consumer gets more electricity for the RĪX.

The RĪX isn’t just a profitable investment, it is also a way to help and support people. In case the RĪX, despite all this still does not convince you by now to support this project bringing many benefits to the people needing it most, creating a green and sustainable energy and with in telecommunications and many other benefits that are going to develop the future in Africa more quickly, just have a look at the profitability and high earnings that exists to encourage the use of the RĪX.

The BEATRĪX platform allows RĪX holders to buy or sell their RĪX through a secure digital Ethereum-based decentralized exchange platform without other additional transaction costs. We want to ensure that the purchase of the RĪX, actually promotes the development of more DETDs by effectively purchasing future green energy that a DETD is planning to produce in the future, unlike now, where there is no legal obligation or technical way to ensure that revenue from green energy projects are spent on promoting more green energy.

The owner of these RĪX Tokens has the following benefits:

-Every RĪX includes an access to a voting system, where reviews and votes on proposed projects are going to take place. RĪX Token-holders are able to vote on the next country on the roadmap, after Africa, that we will expand to, giving the token-holding community the opportunity to interact in the conversation about which projects should go forward. The benefit is that the interaction and participation will be rewarded.

-Every RĪX has from the start an initial charge of 5 kWh, taking this into account for a consumer who used 10 kWh and has to pay for the electricity used, assuming 1 kWh = US $ 10 he has to buy 2 RĪX from the BEATRĪX platform instead of paying $ 1 (because of the 5 kWh initial charge of the RĪX). The same procedure applies for a telecommunication costumer who will get a discount of 25% if they settle their bills through the RĪX. That means for a holder of the Token, there will be a strong demand for the RĪX with a great future value.

-Our plan with the 5 kWh initial charge was to put a high future value into the RĪX but also a way to show our gratitude, as a part of a reward for early believers who will participate, join and support BEATRĪX achieving her goals.

-The RĪX provides an exclusive priority access to the RĪX Distribution auction.

-Tokens not distributed during the token sale will be locked up in an escrow cold wallet held by the trustee. Every time a 1MW DETD is built and goes online there will be a distribution of 1.200.000 RĪX over the BEATRĪX platform from the escrow wallet adjusting supply and demand and to fund further MW development.

-Each RĪX provides an exclusive priority access to 1 auctioned RĪX. The RĪX provides priority access to these auctions for the first 48h. Every RĪX auction is announced in advance; e.g., you have 10 RĪX, the RĪX is auctioned for sale, you can buy 10 RĪX with the priority access and sell them on the Platform afterwards.

Roadmap

Roadmap

3.1 Strategy and Market

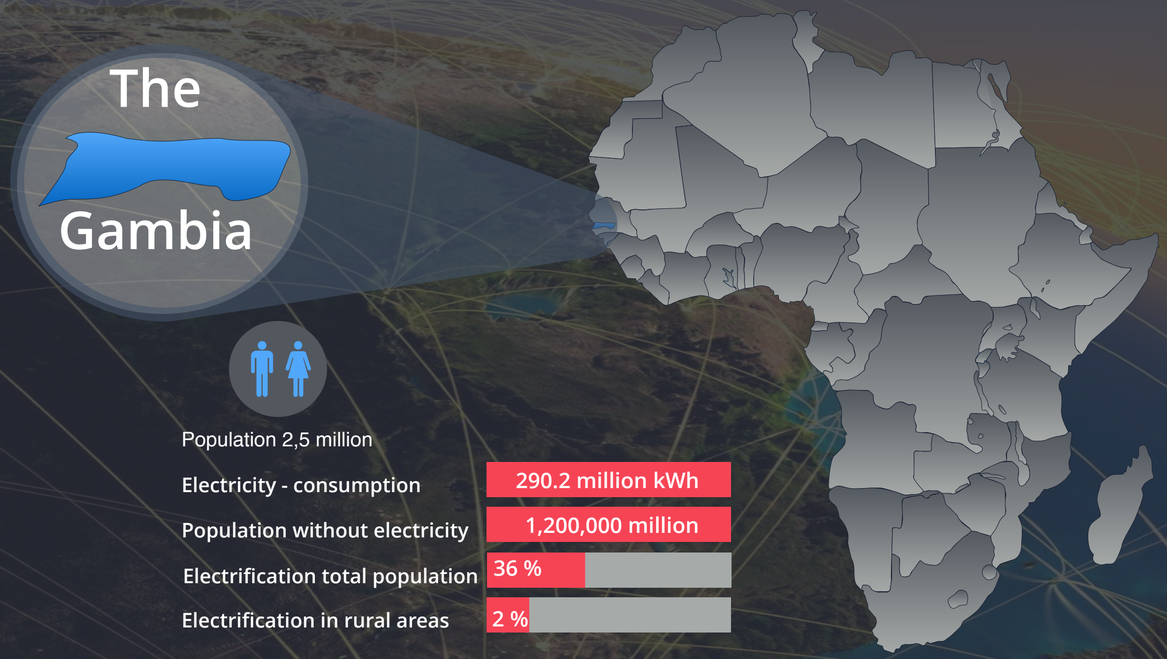
BEATRĪX's First Destination

After the research that we carried out, her first Destination is going to be in the Republic of Gambia, where we will kick-start the project

Why The Gambia?
Going through the facts, shows that the Republic of Gambia is the best example for people in need for energy and telecommunication, what BEATRĪX can provide, helping them to develop the Country.Due
to the rapid growth of Gambia's population in recent years, demand for energy has far outstripped the ability of the State-owned utility to supply the country.

The Republic of Gambia is one of Africa's smallest countries and is slightly smaller than Yorkshire, unlike many of its West African neighbors, has enjoyed long spells of stability since its independence. Adama Barrow's inauguration as president in 2017, ended 22 years of rule by former leader Yahya Jammeh and rings in a new era of respect for media freedom and democracy.

The World Bank is collaborating closely with UN, EU and IMF to assist the government with elaboration of the National Development Plan FY2018-2021. In the energy sector, the World Bank is working together with Africa Development Bank (AfDB), Arab Fund for Economic Development in Africa (BADEA), the OPEC Fund for International Development (OFID), EBID (ECOWAS BANK for Investment and Development), European Union (EU), European Investment Bank (EIB) and Islamic Development Bank (IDB) to support developing The Gambia Energy Sector. Electricity capacity: 105,000 kW country comparison to the world: 177



With a GNP per capita of USD 340, the Republic of Gambia ranks among the poorest countries in the world. Nevertheless, The Gambia is very active in international programs to fight local poverty and enhance the infrastructure and the local industry. One of the major problems is the reliable provision of energy (electricity) and electrification of rural regions. The biggest energy
consumers were households (83%) and the transport sector (13%). To its commercial energy demand including electricity, the Republic of Gambia entirely relies on petroleum.

Roadmap

3.1 Strategy and Market

Regarding Electricity :

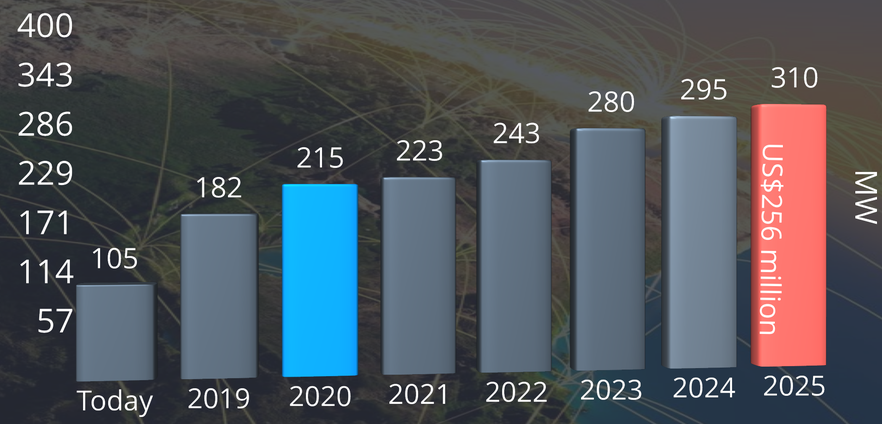
BEATRĪX ‘s approach has been honored and is supported by the Republic of Gambia’s government, who chooses to privatize NAWEC with the energy generating aspect of production privatized. BEATRĪX is going to be an IPP (Independent Power Producer) in the Republic of Gambia.

Regarding Telecommunications :

BEATRĪX will also cooperate with Gamtel to become a telecommunication carrier for Gambia, who can provide landlines, satellite capacity and mobile data coverage for fixed nomadic internet access, which plays a key role in developing data access in less urban areas.

An Energy Department report from the Republic of Gambia:
The update provides the basis for assessing the size and timeline of the investments that are required to realize the model’s projections. Based on this exercise, total investment in new generation projects are estimated at $256 million. Most of this investment is expected to come from the private sector with IPPs (BEATRĪX) being the governments preferred choice for future generation expansion.

If this generation expansion plan were to be pursued, considering the retirement schedule for existing engines, it would result in an expansion towards 310MW of capacity by 2025 as outlined in the Figure. An important implication of this path is that planning would need to start immediately to maximize the probability of meeting the goal to have new plants online in 2019.

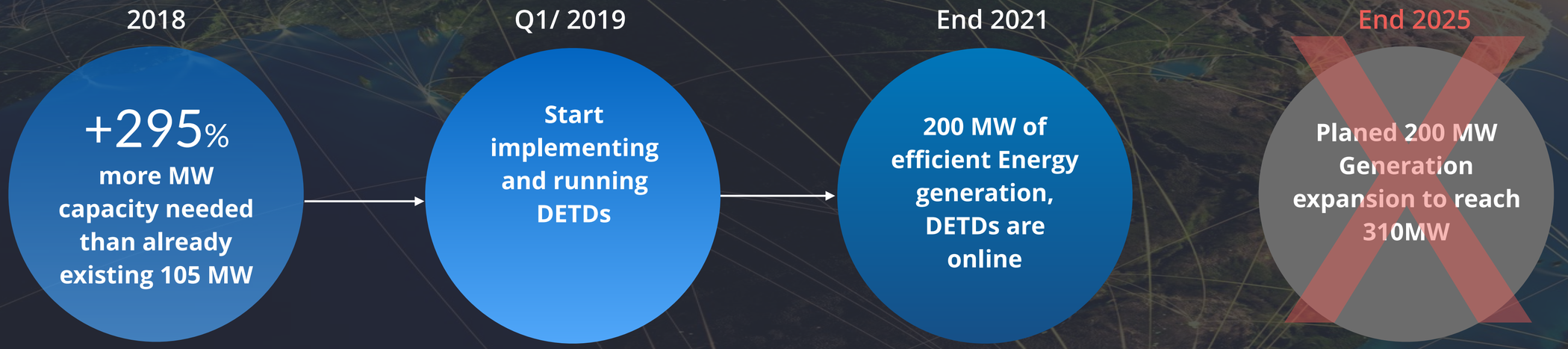


As for today, the Republic of Gambia has a capacity of 105MW online. BEATRĪX would be able to build and install the DTEDs, reaching an additional capacity of 200 MW by the end of 2020, requiring far less than the estimation of $256 million.

Delivering electricity in rural areas which are in need of it, but unlike today where people in these areas have to pay much more for electricity than in urban areas, BEATRĪX is going to do it the other way around, delivering electricity to rural areas less expensive than urban areas.

Roadmap

3.1 Strategy and Market



BEATRĪX IPP

An agreement has been reached with the government to become an independent Power Producer in TheRepublic of Gambia

After ICO

BEATRĪX will start constructing and deploying the first DETD / 50 MW in 2019

US $ 180 million

200 MW DETDs delivering Electricity

BEATRĪX

US$ 256 million

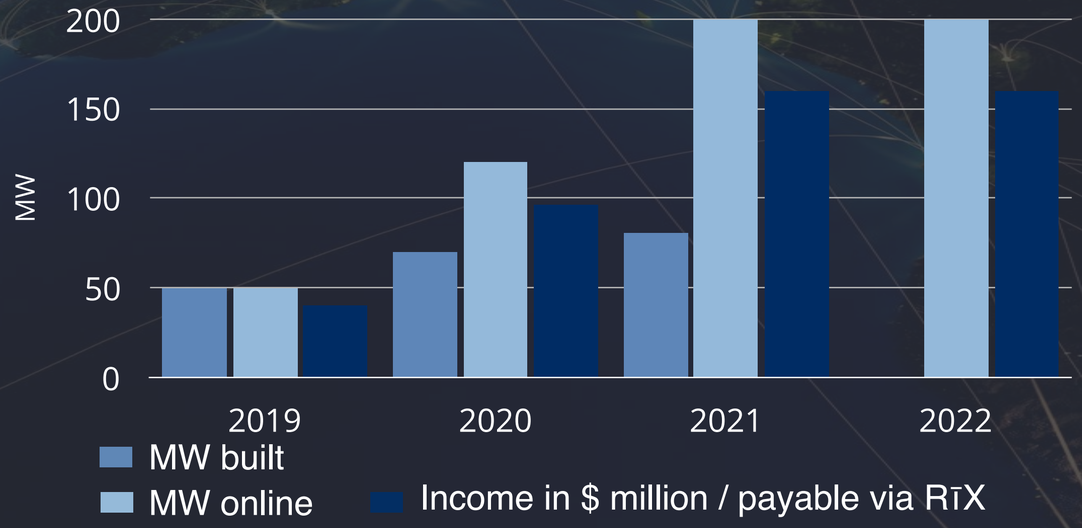
Total investment in new generation projects estimated at US $ 256 million is expected to come from the

Privat Sector

The Gambia project in numbers:

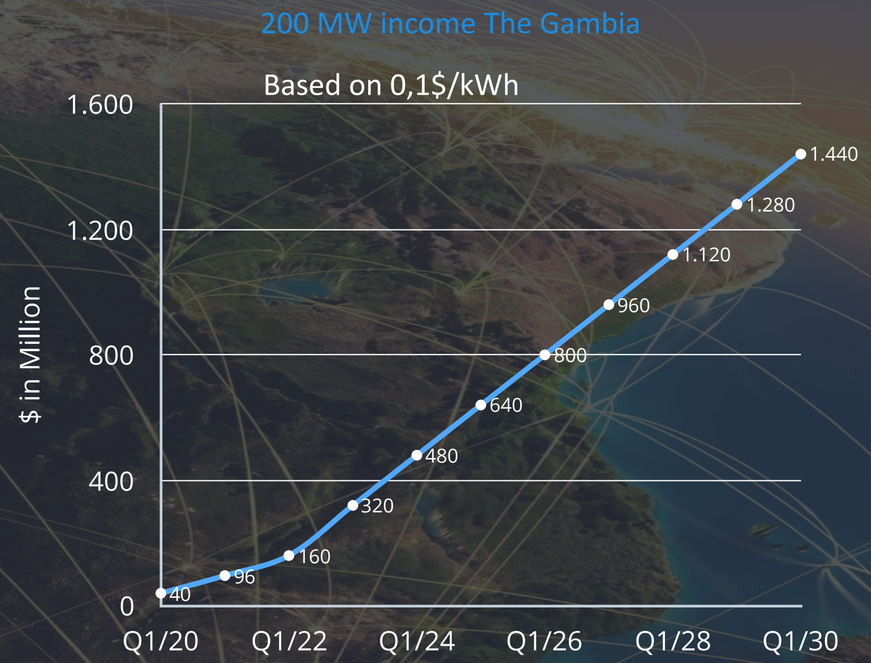
-By 2022, payments of US $ 456 million would have been made with the RĪX. (200MW are online and an average of US $ 0,1/kWh)

-Upon 2022 annually US $ 160 million for electricity payable via RĪX.



Bearing in mind that selling the RĪX for $0.05, with the included 5kWh initial charge, and a price of US $ 0.10 / kWh means for us delivering 5,5kWh per RĪX. Considering only the Gambia project with 200MW per year, we would have to deliver 15 Years of electricity ($2.5 billion) without making profits.

Solely the first buyer of the RĪX would have the benefit.



We have been planning and simulating our vision through different conditions for the last 2 Years, giving the advantages that are included in the RĪX, in our opinion a price of $ 1 per RĪX is very plausible and realistic in a short time frame with a max of 3 Years from now. Our project would only make sense, if the price of the RĪX increases continuously in a healthy way.

A main part of the plan implementing the escrow wallet and energy auctions as a control instrument for market circulation, liquidity, quantity to secure the RĪX from overheating.

Roadmap

3.1 Strategy and Market

MW planned delivery

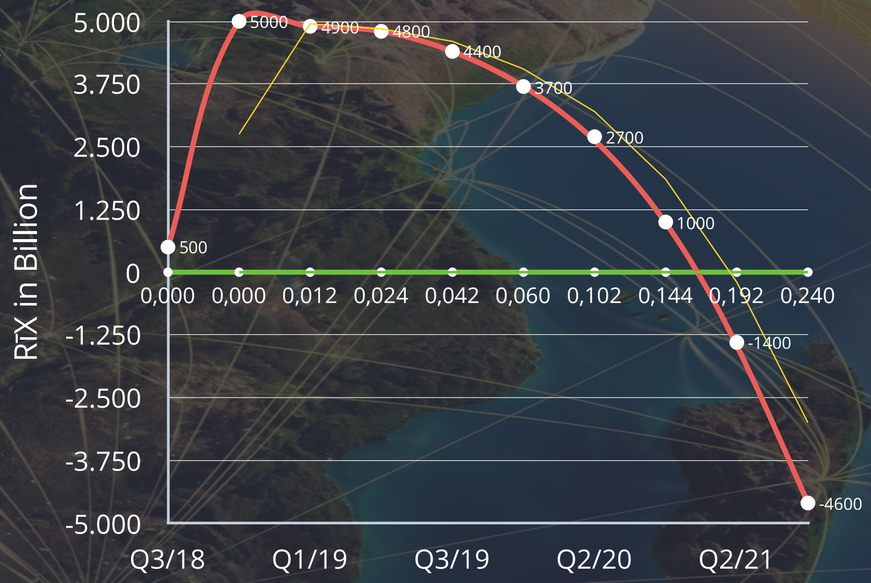
Deployment of the DETDs

RĪX assumed future progression

Based on MW delivery and US $ /kWh

The amount of RĪX in the market

Based on RĪX usage for payments, US $ 0,10/kWh and RĪX escrow auctions supply through per built MW

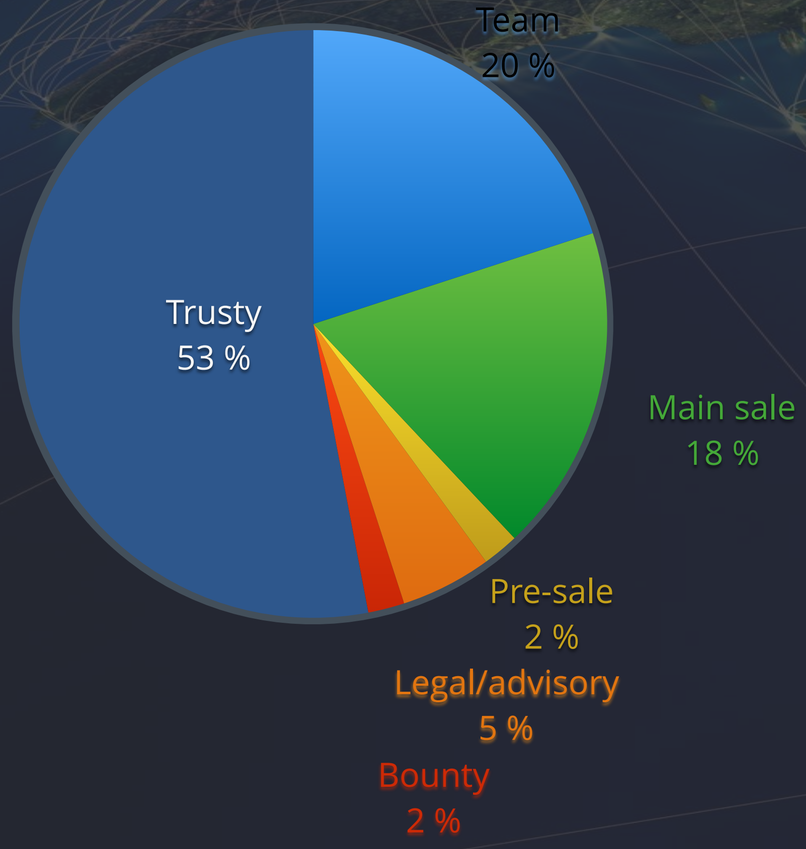


By Q4/2021 and 200MW built, 240 million additional RĪX would have been offered through the energy auctions

Roadmap

3.2 The Crowdsale

Generation Event RĪX



GENERAL INFORMATION

BEATRĪX token (code: RĪX) is a fully ERC-20 compliant Ethereum utility token and will be available in exchange for ETH/BTC/USD/EUR contributions.

Total number of RĪX that will be generated during the Token Generation Event (TGE): **25,000,000,000** RĪX.

Number of RĪX that will be distributed during the whole Crowdsale process: 5,000,000,000 RĪX (**20%**)

Additional offers and sales of the RĪX are not planned.

Presale

Target sum of contributions in the RĪX Presale process **500,000,000** RĪX (**2%**) Offered RĪX exchange ratio:
1 RĪX = US $ 0.025
Phase duration: 18.07.2018 18:00:00 28.08.2018 18:00:00
accepted contributions
Minimum contribution: US $ 100
Maximum contribution: US $ 50,000

Crowdsale

Target sum of contributions in the RĪX Crowdsale process **4,500,000,000** RĪX (**18 %**): Offered RĪX exchange ratio:
1 RĪX = US $ 0.05
Phase duration: 18.10.2018 18:00:00 18.11.2018 18:00:00
Minimum contribution: US $ 100
Maximum contribution: US $ 10,000 € in the first three hours, after that the limit will be removed.

Roadmap

3.2 The Crowdsale

PHASE I: PUBLIC PRESALE

This phase is dedicated to our close Community members and early contributors that will be able to obtain RĪX. We want to ensure that our RĪX will be well distributed among long-term supporters and users of our platform.

BEATRĪX, however, reserves the right to introduce an invite-only Private Presale contribution period, where the bonus for the duration of the Private Presale contribution period may be higher (at Beatrīx's discretion). The RĪX distributed during the Private Presale contribution period will not exceed 20% of all the available RĪX assigned to the contributors.

Contributors will receive their RĪX by the time our crowdsale starts but those RĪX will be locked for the duration of the crowdsale and for a short confirmation period, in which we will check if the token distribution in all phases has been executed correctly. After successful validation of the process, all tokens will be unlocked and become transferable.

PHASE II: PUBLIC CROWDSALE

This phase is dedicated to the general public, HNWIs and small contributors. Phase bonuses:
8 % of additional RĪX for the first 500 million RĪX tokens
6 % of additional RĪX for the second 500 million RĪX tokens 4 % of additional RĪX for the third 500 million RĪX tokens
2 % of additional RĪX for the fourth 500 million RĪX tokens 0% for remaining RĪX

The sale will take place at that fixed price over a period of time to be determined by BEATRĪX (measured in blocks on the Ethereum blockchain) or until all 5,000,000,000 billion are sold.

Contributors will receive their RĪX immediately after we receive their ETH/BTC contributions, however those RĪX will be locked for the duration of the crowdsale and for a short confirmation period, in which we will check if the RĪX distribution in all phases has been executed correctly. After successful validation of the process, all RĪX will be unlocked and become transferable.

There are RĪX that will have a vesting period according to the following schedule:

RĪX allocated to the team will have a vesting period of 2 years. RĪX allocated to the advisors, vesting period of 2 years.
RĪX allocated to the community/ growth no vesting period.

Roadmap

3.2 The Crowdsale

Additional RĪX allocation:

Founders & Team : 20%
Advisory and Legal : 5%
Community and Growth : 2%

Details:

The Know Your Customer (KYC) procedure, where contributors disclose their personal information, is mandatory in both phases before the contribution. There are eligibility requirements in order to participate in our presale or Token Sale and any and all potential purchasers must be qualified by us as an eligible purchaser. On our website BEATRĪX.com, please choose the “Join the Presale” or “Whitelist for Token Sale” button, which will take you through the steps to determine whether you are qualified as an eligible purchaser.

The whitelist period commenced on Q3, 2018 and continued through the targeted public launch of the Token Sale in Q4 2018. We will continue to conduct purchaser eligibility reviews throughout the Token Sale period, but potential purchasers who are whitelisted before the public launch of the Token Sale will receive priority in the allocation of RĪX Tokens.

Please visit: BEATRĪX.com and follow us on Twitter: #AG_BEATRĪX.

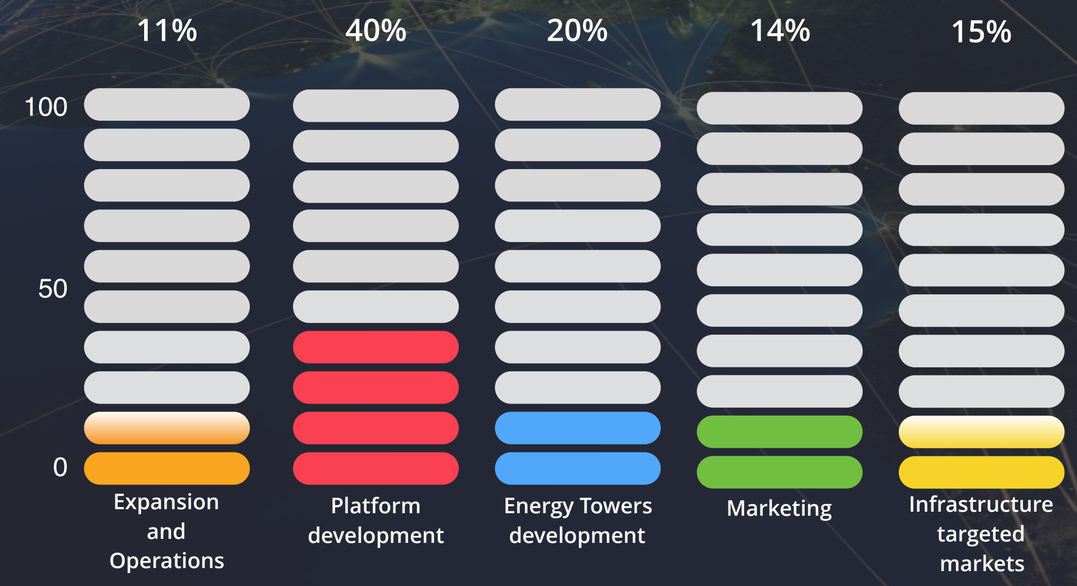
Excess contributions received after the individual phase hard cap is reached will be bounced or returned to the contributing addresses, reduced by the transactional costs. Contributors should NOT contribute ETH/BTC directly from online exchanges, as RĪX tokens will be returned directly to the contributing address. All contributors MUST contribute ETH/BTC from their private wallets.

All dates are in the format: DD.MM.YYYY
For more information, please refer to the Terms of Sale available on our website.

Roadmap

3.3 Funds allocation

Funds allocation Phase I and II :



Funds allocation Phase I

Funds allocation Phase II

BEATRīX's Milestones

Q1 / 2017

- company establishment
- legal issues setting
- concept development
- Crowdsourcing/cooperation

Energy Towers
Patent registration
and approval

Q3 / 2017

- Prototype development
- building the Team
- negotiations on partnerships
- The Gambia / first destination

Q4 / 2017

- website launch
- White Paper published
- marketing campaign

11.07.2018

- Pre-sale start
- Contracts with cooperation
- Partner in Africa
- Initiate major exchanges
- Listing Process

18.07.2018

- Construction site in The Gambia
- Contracts with the Gambian
- Government regarding IPP
- Tests of the Platform

15.09.2018

BEATRĪX's Milestones

18.10.2018

- The BEATRĪX Platform goes online
- Platform integration into the electronic marketplace

Q4 / 2018

- BEATRĪX Crowdsale
- Testnet launch / Mobile App
- New partnerships
- Marketplace support

Q1 / 2019

- Mission accomplished in The Gambia
- 200 MW DETD's built

Q4 / 2021

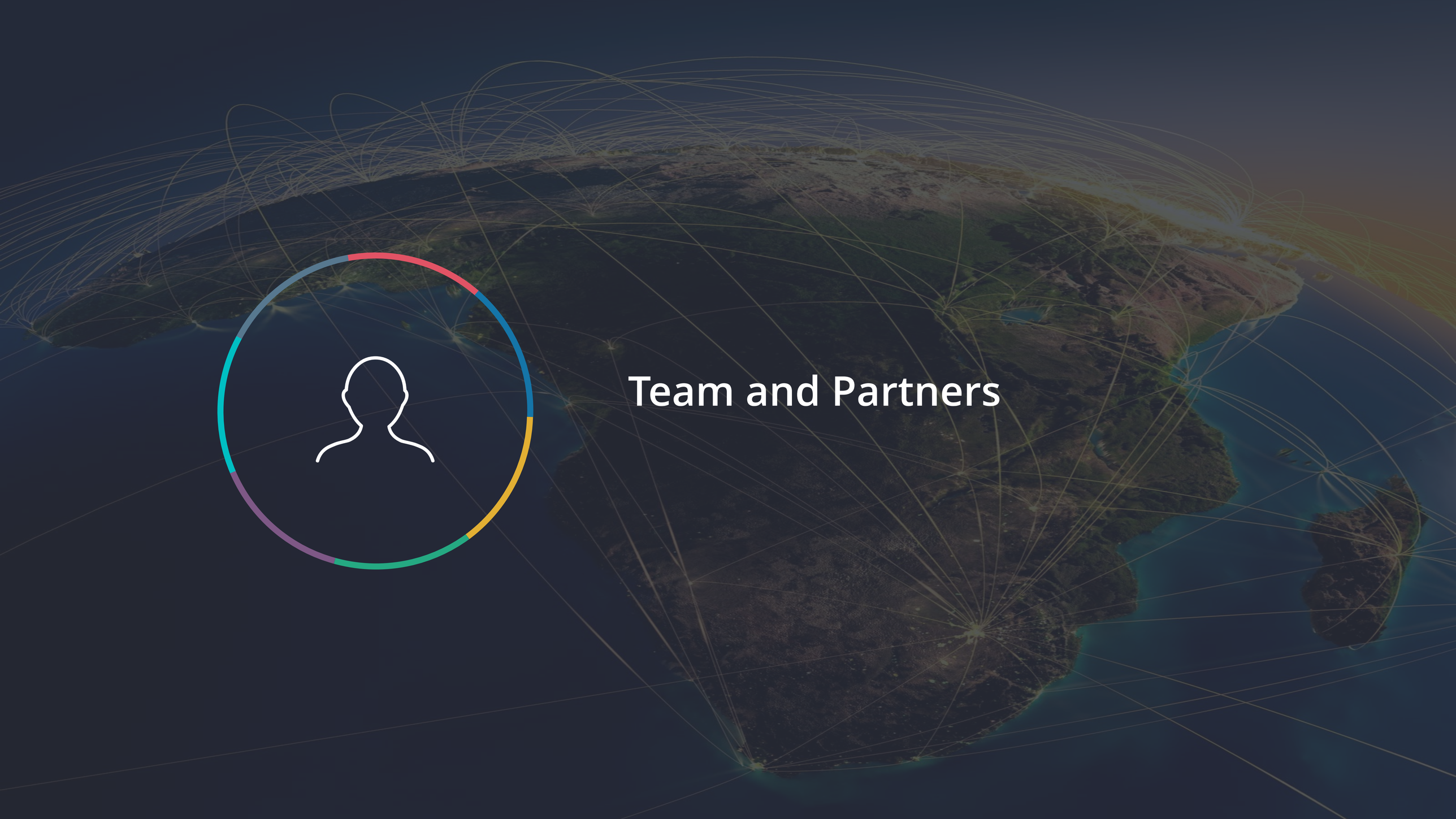
- First 1 MW DETD Activ
- First payments for
- electricity with the RĪX

Q4 /2021

- US $ 160 million
- Energy payments p. Y
- for the 200 MW in
- The Gambia
- Payable with the RĪX

Q4 / 2022

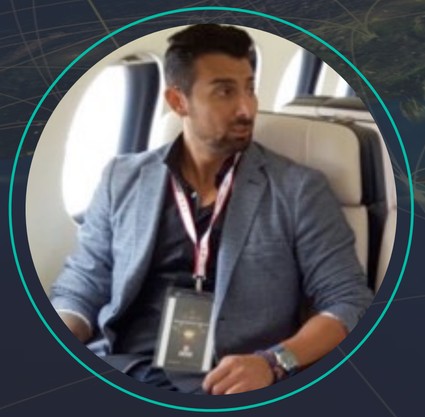
- US $ 455 million
- Payments for electricity
- Consummation by 2022
- payable only with the RĪX



Team and Partners

Meet the BEATRĪX Team

4.1 Team



Haitham Sabra
Founding Partner
CEO

Andreas Buxbaum
Founding Partner
COO

Baskurt Okaygun
Founding Partner
Advisor

Team and Partners

4.1 Team

Stanislav Rieger
CFO

Prof. Volker Stauch
Business Development

Prof. Dr.-Ing. Marcus Geimer
KIT University

Thomas Matlari
Strategy

Peter A. Iten
BM Chairman

Team and Partners

4.1 Team

Sigmund Martin Rheindt
Legal / Trusty

Zaki Akbayir
Inventor ET

Barbera Bertino
Customer Relations

Kiriakos Angelidis
Sales & Operations

Hasen Malik
Sales & Operations

4.1 Team

Andreas Cortina
Social Media

Mario Zelic
Marketing

Athar Ahmad
Social Media
Specialist

Amit Gill
IT

Ilker Gök
CIO

Team and Partners

4.1 Team

Rob Sukar
Head of S&O

Sary Azakir
IR

Essay Balla
Telecommunications
Prof.

Leandra Bertino
CMO

Faisel Durrani
Sales
Operations

4.1 Team

Guiseppe Tosca
Crypto

Danny Azakir
Head of Development

Gurcharan Gill
Smart Meter
Specialist

Sharon Dammel
Media Strategist

Hamid Tahvildari
Marketing Africa

4.1 Team

Hassan Durrani

ICO and Blockchain Analyst

Arsalan Khan

Blockchain / Smart Contract Developer

Erkan Celik

Sales

Noman Sohail

Art Director

Muhammad Sameer

Senior Software Engineer

Humanitarian Activities

Humanitarian Activities

5.1 Drilled water wells

SOCIAL AND HUMANITARIAN ACTIVITIES

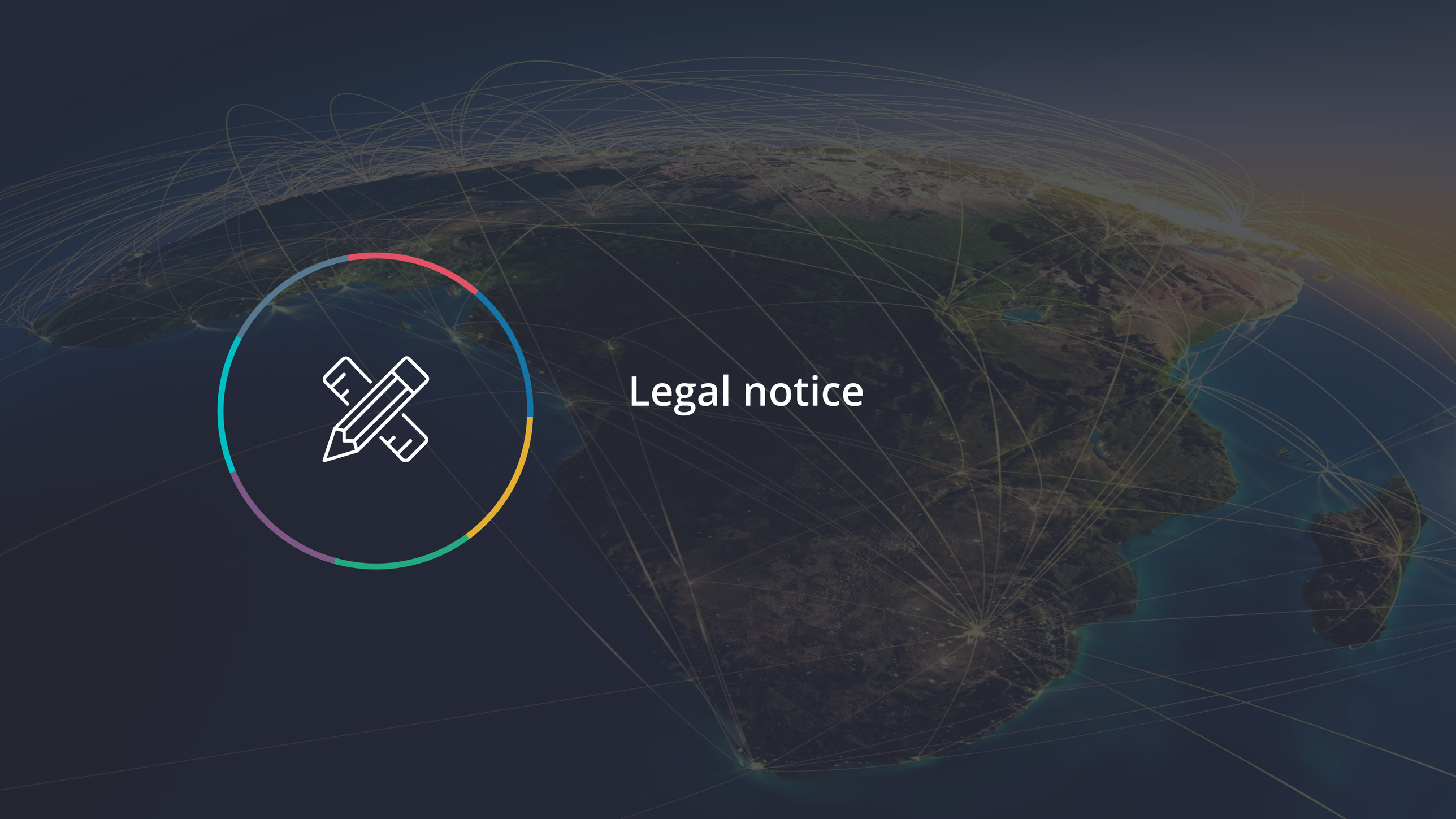
With every 1 MW completed, 5 Drilled water wells will be built in the area of the DETD's and donated to the people including Outdoor Refrigerated and nano -filtered drinking water fountains.

Services are going to be installed by our Partners ELKAY'S and The Water Project.

Since 1920, Elkay has been manufacturing state-of-the-art products that make a positive impact all over the world. Elkay offers Europe our most innovative drinking water solutions, residential stainless steel sinks, and commercial kitchen products. Our world-class drinking water solutions include bottle fillers, water coolers, drinking fountains, and chillers.

The Water Project, Inc. is a non-profit organization unlocking human potential by providing reliable water projects to communities in Sub-Saharan Africa who suffer needlessly from a lack of access to clean water and proper sanitation.

There are still more to accrue in the near future.



Legal notice

Legal notice

6.1 Legal notice

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Präsident des Verwaltungsrates :
Iten, Peter A.

Mitglied des Verwaltungsrates :
Flechsig, Anneliese

VAT : CHE-115.115.718 MWST

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