

**INTERNET OF THINGS, ARTIFICIAL INTELLIGENCE  
AND BLOCKCHAIN EMPOWERING ENERGY CONSUMERS**

## **ROBOTINA ICO: WHITE PAPER**

“ For the first time in the history, opportunity, technology, legal and social conditions are ready for Robotina Universe. Internet of Things, Blockchain and Artificial Intelligence are bringing great benefits to users and power suppliers. Empowered people save energy and they use smart grids to save, earn and reduce pollution on our planet. We don't do more, we just do it smarter. ”



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# 1. EXECUTIVE SUMMARY

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Worldwide, the total consumption of electricity reached almost 20.000 TWh<sup>1</sup> with an average price of 0.14 USD per KWh, which equates to USD 3tn per year! Commercial buildings account for 40-50 % of this amount. Besides the growing consumption, the key issue in the power industry is the unpredictability of supply and demand of electricity, such as the influx of renewable sources, e.g. solar panels and wind turbines. They are not producing electricity when there is no sun/wind and they cause an excess in the grid when the weather conditions are favourable. On the other hand, there are more and more electric vehicles charging which is very unpredictable. Both issues make the electricity grid extremely unstable, which causes high costs of the system's operators and also high costs for the end-user. These situations require substantial investments in new infrastructure and smarter use of the existing one. **In order to sustain our actual standard of living, we must reduce (per capita) and shift (in time) the consumption of electrical energy.**

**This is exactly what Robotina, with its 28 years' experience, delivers to households and businesses. With the Robotina Platform, the future is HERE.** We have tested, demonstrated and validated, that we can save 10-20 % by using state-of-the-art technology, which is available and feasible NOW<sup>2</sup>. In our vision, our community members collaborate in order to save and earn money while consuming electrical energy. This vision becomes reality with the deployment of the Robotina Platform.

The Robotina Platform will be a vertical, high-tech all-inclusive enabling solution, consisting of connected Internet of Things (IoT) elements (things, processes, data, people) and the Power Platform (PP). It will use Smart Rules, Artificial Intelligence and Blockchain technologies. It will be run in the cloud, available as a service. Robotina Platform and connected IoT will execute thousands of calculations per second. Each calculation will result in a small benefit and a small slice of revenue, which will accumulate every second. At the end of the day, this will become the driving force of the business. **Artificial Intelligence, machine learning, patented multi-objective optimization and blockchain technology allows us to disrupt the electricity market and implement a collaborative sharing economy business model, which distributes numerous benefits to the participating users.**

We will 'empower people' to become our partners in **revolutionizing the traditional power network**. It is about a **new paradigm** of designing and operating the electrical power system with the objective to improve its efficiency, to enhance user engagement, increase service quality, and save costs in power generation, distribution, and consumption. Constant negotiations between the community members with aggregated data and the smart grid will enable us to **create a state-of-the art disruptive business model.**

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<sup>1</sup> Enerdata. (2018). Global Energy Statistical Yearbook 2017. Accessed at: <https://yearbook.enerdata.net/electricity/electricity-domestic-consumption-data.html>

<sup>2</sup> Zupančič, D. (2018). Robotina and Josef Stefan Institute. Accessed at: <https://www.ijs.si/ijsw/V001/JSI>

**The creation of a connected community, whose members will gain substantial savings on energy costs, generate significant revenues as well as contribute to a greener environment and sustainable development by optimizing energy consumption and consequently reducing emissions, had now begun.** Even more, the community will be a part of a new social media, which will connect people, processes, things, and data from homes, businesses and other institutions' buildings. They will share real-time data, messages, achievements and footprints. Businesses will have access to qualified information and users' needs, which will convert into **benefits for all participants**.

**Direct, native benefits for each connected user (community member) will be as follows:**

- **AWARENESS & CONTROLL:** Energy Management System (EMS), HIQ-Home and other IoT will be connected to the Robotina Platform, so that users will be able to monitor their sites/entities and IoT and control them at anytime from anywhere.
- **SAVINGS (ENERGY EFFICIENCY & DYNAMIC ENERGY PRICING):** Analytical tools, remote control, advanced rules, multi-objective optimization and Artificial Intelligence will help users to achieve fast ROI (Return on Investment) saving more than 20 % on their energy expenses. By investing in energy efficiency, users will reduce CO<sub>2</sub> emissions and enjoy tax benefits.
- **SECURITY & SAFETY:** Artificial Intelligence will detect unusual and dangerous situations and send notifications to the user.
- **COMMUNITY BOOK:** Users and their sites/entities will cooperate by reporting their real time data, sending notifications and forming social networks and thus participating in the sharing economy business model.

**Additional benefits for participating users will be based on the collaborative sharing economy business model, and will be derived from:**

- **POWER SELLING:** Community members will use smart grids to earn money based on their activities, namely by providing on- request variable consumption to energy suppliers and grid operators. Earned revenue will be distributed among the eligible participating users, based on and in correlation with their activities.
- **CROWD BUYING:** The platform will enable users to form and participate in the crowd buying initiatives in order to negotiate significant discounts on energy prices.
- **MARKETPLACE ACTIVITIES:** Users will participate in smart-contract based businesses. They will be able to sell or buy various services, available to the connected users and 3rd parties.
- **INTERNAL TRADE:** Those who produce energy will be able to sell it to other users, thus eliminating the need for middleman and unnecessary costs.
- **DATA SALES:** Community will sell anonymous data to the grid stakeholders and remunerate participating users.
- **ENERGY SERVICE COMPANY (ESCO) & VIRTUAL POWER PLANT (VPP) CROWD FUNDING:** Users will be able to use Robotina Utility Tokens (ROX) in order to participate in crowd funding of the profitable projects using ESCO or VPP schemes.

**Benefits for big and corporate users:**

- **ENERGY EFFICIENCY AND FAULT PREDICTION:** Large consumers and corporate users will connect their buildings to the Robotina Platform and subscribe to its services. Our Cognitive Optimization System will help them reducing their energy and maintenance expenses by an estimated 30 %.

**As seen above, community members will enjoy a dramatic reduction in their overall energy costs. They will gain control and boost their safety and security. Finally, they will earn and**

**contribute to their community's benefits as well as increase their responsibility towards nature and future generations.** In order to provide transparency, traceability and safety of the entire network and community, we are implementing an additional feature, the Robotina Utility Token (ROX). The token will let members acquire things and services in a virtual marketplace at a 3 % discount rate and will enable them to receive additional benefits in correlation with their collective activities. **User benefits will be the driving force, influencing exponential growth in a number of connected users. More users will cause more transactions and accelerate the wider adoption of the Robotina Utility Token (ROX).**

The Robotina Platform will be crypto-friendly and Robotina Utility token (ROX) will be the exclusive token, used in all internal transactions. The user will receive a special discount when paying with ROX (one of the ROX utility features), whereas the services and products sold on the Robotina platform could also be acquired with other cryptocurrencies, tokens or fiat money. Any other means of payment will be converted into ROX tokens and intended for the funding of the benefits earned by community.

A public Initial Coin Offering (ICO) will take place in March 2018 in order to collect contributions (\$28.5mio - Hard Cap) from supporters and to award them with ROX tokens. All 815.000.000 ROX tokens sold will be generated after the ICO (1st May 2018). Later issuances will be disabled in the smart contract for ever. In summary, the deregulation of the electrical supply industry and the related legal framework enabled the separation of roles of electric industry stakeholders, removes monopolies and opens the market place. Most states have committed to reduce CO<sub>2</sub> emissions by increasing renewables in their portfolio by 2020 and to use a smart grid concept. New technologies and connected devices are widely accepted and new, platform based business<sup>3</sup>, are overtaking the traditional ones.

**For the first time in the history, opportunity, technology, as well as legal and social conditions are favourable and ready for the Robotina Platform to step onto the stage. Internet of Things, Blockchain Technology (enabling smart contracts) and Artificial intelligence bring great benefits to users and investors. Connected to the Robotina Platform, an enabling Universe, empowered people will save the electricity by using smart grids in order to save and earn money and reduce the pollution of our planet. We won't do more, we will just do it smarter!**

We "empower the people" to become part in revolutionizing the traditional power network systems. It is a new paradigm of designing and operating the electrical power network with the objective to improve efficiency, enhance user engagement, increase service quality, and save costs in power generation, distribution, and consumption. Constant negotiations between the community with aggregated data and the smart grids, enables us to create a disruptive business model.

In Robotina we envisioned this future based on existing products and solutions which Robotina has developed in the last 28 years. **To take the opportunity of this moment** we have the technology (IoT, blockchain, AI), the necessary conditions as sale and distribution of energy is deregulated, and finally, the consumers are keen to join a collaborative consumption model where they see benefits. By upgrading our solutions and connecting all participants with the platform, we will create communities, which will be beneficial for everyone.

We are incorporating the ROX Utility Token to provide transparency, traceability and safety of the entire network and community. The token will enable members to acquire things and services in a virtual marketplace with 3 % discount, whereas the blockchain technology also enables us to reward their individual and collective activities with ROX tokens (in correlation with their active participation).

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<sup>3</sup> e.g. Booking.com, Uber

## 2. INTRODUCING ROBOTINA

Robotina is a Slovenian company, incorporated in 1990 and focused on innovation in automation and control technology. Our Internet of Things (IoT) enabled hardware (HW), cloud software (SW) and various solutions have demonstrated our excellence in:

- Controls in industry, buildings, energy and infrastructure,
- Cloud based software and SaaS (Software as Service) platform for real time/real world connected IoT devices,
- Cognitive technologies, machine learning and artificial intelligence.

All products include our proprietary technology. Combined with expertise and ability to introduce new solutions swiftly and economically, it represents a solid base for every control solution and sets new standards for today and for the future. **Robotina has its own in house R&D and manufacturing facility for all its products. This manufacturing facility enables Robotina to deliver top quality at very competitive prices.**

### 2.1 ROBOTINA'S HISTORY

From being a subcontractor, the company then developed and started producing its own devices and gained experience and market share in Japan, India, the Middle East and other markets in electronic devices for control, management and energy efficiency. The company's strategy together with its products and services, developed according to the market needs and expectations as well as to the environmental and digital challenges: Robotina is now positioning itself as a smart devices and services player aiming at improving energy efficiency for both homes and businesses. The company is indeed offering smart devices (hardware) for remote data control and management, IoT software and applications, a cloud based computing platform for energy trading and services between producers, consumers (marketplace for community members), Artificial Intelligence software for consumption forecasts and advices on how to save energy and costs, blockchain technology (Ethereum based community token, smart contracts to access the platform and its services and to process any transaction within the platform and community).

Company developed and introduced its first fully independent product in 2001, a range of distributed Programmable Logic Controller PLC systems used in industry, buildings, infrastructure and remote management of renewable energy (photovoltaic) plants, smart grids and smart cities. In 2007, the company built its new headquarters, R&D laboratories, manufacturing plant and warehouse in Hrpelje (Kozina), on the crossroads between Italy, Slovenia, Croatia and Austria. The building is the company's show case and utilises all its technologies, making it green, zero-emission and net electricity producer (i.e. we produce more clean energy than we consume in total).

The company is today well known as a comprehensive technology and solution provider both for final customers and OEM. Our strategic focus evolved through three main periods as shown in the table below:



Period:	1990 - 2010	2010 - 2015	2015 - 2020
<b>Main product:</b>	B2B services	OEM services	Vertical integrations
<b>Focus on:</b>	Automation	R&D > products	Products & solutions
<b>Application fields:</b>	Industry & buildings	Energy & renewables	Smart cities and grids
<b>Target market:</b>	Domestic distribution	International expansion	Scale up
<b>Future orientation:</b>	R&D	New business models	Subscription business

Besides know-how in process control, we provide also the expertise across the whole process itself. We have specific teams for processes automation, control and supervising systems, telemetry and tele-control, energy management, intelligent building management systems, control centres and smart cities.

Our unique fusion of industrial expertise, propriety control technology, highly developed software platforms and tools, ability to understand customer needs when prototyping and manufacturing plant, guarantees the best performance to our clients, who want to focus on their own core competences. With the help of the situation analysis and the evaluation of the results, we are always capable of suggesting high-quality solutions and carry them out from the initial concept to the final delivery.

**Our solutions provide comfort, safety and energy efficiency in buildings.** We take care of integration of electrical and mechanical appliances, security, access control, multimedia and other systems in energy efficient and intelligent buildings. Robotina is one of the leading providers of renewable energy solutions in Slovenia. We have also developed a wide range of equipment and solutions including solar plant supervisory systems, string monitors, control units and application software.

The company does not only offer products but also services and therefore incorporates **complete end to end solutions**. Services include research and development, prototyping and manufacturing of custom-designed electronic components.

Today, Robotina services and supplies more than 800 costumers. We operate in the following countries: Slovenia, Croatia, Austria, Germany, UK, the Netherlands, Belgium, Denmark, Sweden, Lithuania, Russian Federation, Ukraine, Turkey, China, Brazil, UAE, Qatar, South Africa, India, Singapore, Japan and many others.

Since 2012, we have been progressively entering in the Asian markets including Japan, Taiwan, Thailand and India, especially in the areas of building automation and solar power plant supervising.

**Apart from selling our products directly, Robotina works with over 15 distributors and system integrators all around the world, which sell and promote our products.**

Robotina is an active member of the Process Control Technology Network (<http://www.tvp.si/>), founding member of the Slovenian Photovoltaic Industry Association (ZSFI), founding member of JETNET (Slovenian cluster for cooperation with Japan) and founding member of the Chamber of Commerce and Industry of Primorska, the regional chamber of economy.

Our two registered R&D teams actively cooperate with the Institute Jožef Stefan (<http://www.ijs.si/ijsw>)<sup>4</sup>, universities, research institutes and other companies.

<sup>4</sup> A leading research institution in Slovenia in the field of natural sciences, which also figures prominently in H2020 projects. According to the Horizon monitoring report published in June 2016, it is among top 50 PRC institutions in H2020.

In 2012 Robotina was certified as “excellent small and medium enterprise (SME)” by the Slovenian Chamber of Commerce and Industry. The company also holds several quality certificates and excellence awards.

In the period up to 2020 and beyond, Robotina seeks to become a leading company in the production of specialized connected control devices and systems on the European and the global market. These goals can be attained with top-quality products and services, innovations, quality user services, and environmentally friendly technologies and products.

To do so, we have invested in development of propriety technology:

- Cybro-I, II and III (Q1/18): distributed control system with all the necessary hardware and software, which makes it very suitable for customisation and tailor made solutions to control challenges. It the first IoT programmable controller.
- SMIP: Cloud (SaaS) enabling platform, which securely communicates with Cybro controllers to bridge the gap between controllers (real world) and Internet (virtual world). With this, we have opened the way to vertically integrated solutions (from sensor to Internet and back).

**The competitive advantages** of the company can be summarised as follows:

- Well-structured product range suitable for automation of distribution systems, suitable for system integrators and OEM users. Fully Internet enabled – “from sensor to Internet and back” (smart green technology) solutions.
- Market ready solutions based on our own technology with specific incorporated Business Intelligence. Vertical solutions for: photovoltaic (PV) solar power plants monitoring and optimisation, off-grid, micro grid hybrid power supply systems with storage, Demand Side Management (DSM) smart grid systems, smart homes, smart and sustainable buildings, smart cities.
- Specific team for processes automation, for control and supervising systems, for the food and beverage industry, for telemetry and control, building and infrastructure, environmental monitoring and for energy management.
- With situation analysis and the evaluation of the results, we are capable of suggesting high-quality solutions and carry them out from the idea to the final delivery. In the case of an OEM customer, the company can execute complete project from specification to serial production in extremely short time frames.
- We offer complete solutions. Company’s services include research, development and production of custom-designed electronic components and today already the widely known PLC controller CyBro-II/III family.
- We are one of the leading providers of renewable energy and energy storage solutions. Our products: solar plant supervisory system, Energy Management Systems (EMS), string monitors, and application software, are some of the leading solutions in the industry. Company technology and products are sold to some of the most advanced companies in the world.
- We offer a complete service as the high-quality technical support, training and service are included in the company’s operations. The maintenance and continuous support is ensured during and after the guarantee period.

## 2.2 ROBOTINA'S KEY REFERENCES

The market changes and so we change too. The immediate future belongs to Internet of Things (IoT), Software as a Service (Saas), Machine Learning (ML) with Artificial Intelligence (AI), enabling platforms and blockchain based solutions. Sharing and collaborative economy business models are making fast progress towards becoming mainstream business thinking. Our business model, focus and targets are fully aligned with the future.

Robotina has a substantial know-how in the field of smart buildings and cities, efficient use of energy, sustainable development, and renewable energy sources. An important advantage of the company is the development of its own innovative technology, products and solutions, which are being constantly improved to meet the needs of the market. The company has vast experience in projects concerning energy control and management like Messib and EE Highrise. Relevant activities include:

- **Smart buildings** - (1) Slovenia: RPL Residential Area, Lucija; Janez Krstnik Retirement Home, Ljubljana; Rotonda Business Complex, Ljubljana; Dunajska vertikalna Business and Residential Complex, Ljubljana; Tehnopolis Business Complex, Celje; Primorje Administrative Building, Ajdovščina; Gold Club Administrative Building, Sežana; Praetorian Palace, Koper; Rimske terme Hotel Complex, Rimske Toplice; Metropol Hotel, Portorož; Grand Hotel, Portorož; Paediatric Clinic Ljubljana; General Hospital, Izola; Kempinski Hotel, Portorož; (2) United Arab Emirates: Louvre Abu Dhabi and Abu Dhabi Airport, Abu Dhabi; Dubai Customs, DP HQ and Imdaad HQ, Dubai; (3) Qatar: Islamic Bank, Doha; (4) Saudi Arabia: Criminal Court, Riyadh; (5) Croatia: Cineplex, and Esplanade Hotel, Zagreb; Serbia: Cineplex, Belgrade; Bulgaria: Cineplex, Sofia; (Qatar); (SA);; and many more;;
- **Infrastructure automation** - Zeleni Park - car parking building, Koper; Vodice water supply system, Vodice; Okolje Piran sewage, Piran;
- **Industrial automation** - Slovenia: Port of Koper, Koper; Gorenje, Velenje; Droga, Izola; Ljubljanske mlekarne, Ljubljana; Serbia: FAM; Croatia: Vindija; Romania: Port of Constance, Qatar: New Port, Doha;
- **Photovoltaic power plants** - 40 plants in Europe, 10 in India, 7 in Japan, 2 in Thailand, 1 in Taiwan, 3 in Croatia, and South Africa);
- **Energy storage and management systems** - Austria: Neovoltaic, Energie-Graz; Japan: Hitachi; Germany – MAGE;
- **R&D projects** which lead to prototypes and products - Slovenia: Wravor, Škrlj, Alpineon, Epipack; Japan: Hitachi, Sanrex; Germany: Hitachi; Austria: Neovoltaic, Netherlands: Hiflex;
- **IMDAAD (UAE)** is a leading provider of integrated building management services in the United Arab Emirates (UAE), supporting over 1,000 of the most important buildings in Dubai. In 2014, the company entered into a partnership with Robotina d.o.o. to carry out an ambitious project of establishing the Network Operations System (NOC), which would enable a remote control and management of buildings, contributing to greater energy savings, lower operational costs, and increased energy efficiency. The project supports the UAE vision of developing “green” sustainable living solutions and turning Dubai into a “smart” city. IMDAAD has been awarded for the best FM technological implementation of 2016 in the UAE with our technology, services and transformation (see <http://www.constructionweekonline.com/article-30216-imdaad-commissions-robotina-to-deploy-in-house-noc/>);

- **ARSO (Slovenian Environment Agency)** – All water monitoring stations in Slovenia including critical level monitoring (see <http://www.arso.gov.si/>);
- **HITACHI, Germany** - We delivered a smart community project Chemicals to Speyer in Germany, the solution of self-consumption management (see <http://www.smipcloud.com/project/selfconsumptionhems-hitachi/>);
- **PANASONIC** - In the end of March 2013 Robotina put into operation a complete monitoring and management system for the first two photovoltaic power plants in Japan: The installation was done in cooperation with Japanese partner companies SanRex and Panasonic (see <http://www.robotina.com/2013/04/first-spss-installations-in-japan/>);
- **SHARP** - Thin film solar power plant monitoring system, which used to be the biggest such installation in the world at the time of delivery. The nominal capacity reaches 150MW;
- **ABB** - Several thousand SMB boxes have been customized and delivered to ABB, Japan;
- **MICROSOFT** - Azure Cloud based energy efficiency and fault detection system fully integrated with clients BMS helps delivering outstanding savings.

The above projects have given us the opportunity to understand the state-of-the-art technologies, customer needs and technological gaps, which can be bridged with new approaches. We have had the opportunity to deploy competitors' systems and to develop our own systems. These projects have allowed us to showcase our talents and ability to deliver in these sectors.

HIQ Home (a system of devices and software for home automation) is a spin off development based on Cybro-III (hardware and software tools) and SMIP (HIQ Platform and SaaS). Specific know-how has been developed through extensive research both in cooperation with institutes (Institute Josef Stefan), universities (Ljubljana University) and through cooperation in 6<sup>th</sup> and 7<sup>th</sup> framework programmes (MESSIB and EE Highrise).

During 2015-2017 we have successfully delivered a Cybro/SMIP based solution used by Japanese agency NEDO in their demonstration project in Speyer, Germany.

## 2.3 OTHER RELEVANT ACHIEVEMENTS

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- Robotina has **two registered R&D teams** (according to the Slovenian regulations these teams have to be formally registered and accreditation must be maintained to enjoy status of R&D institution). We have established cooperation with several excellent institutes and universities in Slovenia and abroad.
- We have formally implemented and we actively maintain our "**innovation manual**", which is a base for management of our innovation activities and developments.
- **Existing manufacturing plant** with qualified personnel and an excellent record in manufacturing our Robotina developed products for the market and for strategic partners, which include: Neovoltaic (Austria), Hitachi (Japan), MAGE (Germany), Sharp (Japan), Microsoft (US).
- **Cooperation and partnership** culture is well developed and extremely important in the globalized world.
- **Excellent quality record** through our history. Our Quality Assurance (QA) is designed to track all the important activities, material and testing results, products are marked by the means of

labelling or laser engraving and are identified by a unique serial number. PCB production is outsourced, critical and customized components are produced by us, while passive and non-critical components are procured by sub-suppliers. Quality Assurance and Quality Control are implemented and are audited by some of the world's famous customers from Germany and Japan. We follow the ISO 9001 standard, even if formal certification was never started.

- Robotina received **a seal of excellence** from the EU Commission.
- We received the **AAA certificate** from Dun & Bradstreet and **Excellent SME** certificate from the Slovenian Chamber of Commerce and Industry.
- Robotina holds **seven patents**:
  - 23933 (device and method for obtaining energy through window blinds);
  - 23934 (device and method for secondary lighting of buildings using window blinds);
  - 23932 (device and method for secondary lighting of rooms using window blinds);
  - 23937 (device and method for heating, cooling and ventilation using window blinds);
  - 24817 (ultrasonic sensor with RGB LED);
  - P201400389 (automatic lighting control in closed rooms using two sensors);
  - P201400388 (system for setting and storing scenes using two-stage matrix).

Above-mentioned patents are relevant for energy saving and comfort enhancement, with the P201400389 and P201400388 directly implemented in HIQ Home.

**We have filed European patents for our core innovation, a multi-object optimization.**

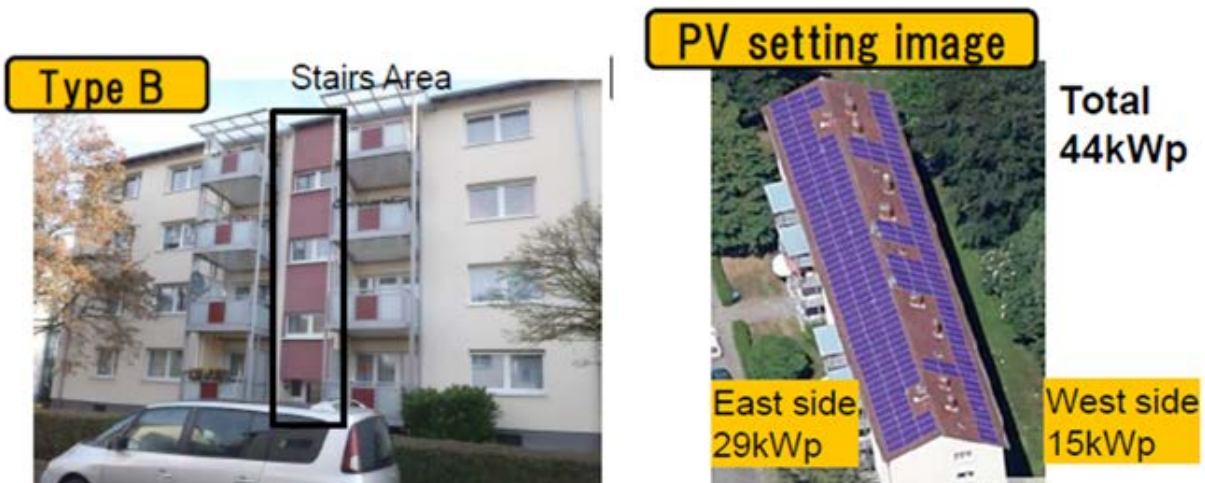
## **2.4 ROBOTINA'S RELEVANT RESEARCH AND DEMONSTRATION PROJECTS**

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We develop our products and services for a highly competitive global technology market. This is only possible in cooperation with top quality research labs, universities and other companies from around the world. R&D projects have helped us develop, test and demonstrate our solutions. They are constantly monitored and evaluated by international experts and professional bodies. Robotina has an active role in the following projects:

- Multi-source Energy Storage System Integrated in Buildings (FP7) (see <http://www.messib.eu/>);
- Energy Efficient Demo Multi-residential High Rise Building (see <http://www.ee-highrise.eu/>);
- The GOFLEX project innovates, integrates, further develops and demonstrates electricity smart-grid technologies (see <http://www.goflex-community.eu/>). This is the most relevant smart grid demonstration project in Europe. It includes homes, cities, electrical vehicles and factories;
- Coalition of 26 companies, who cooperate in the smart and sustainable home development (see <http://www.iq-home.si/en/>).

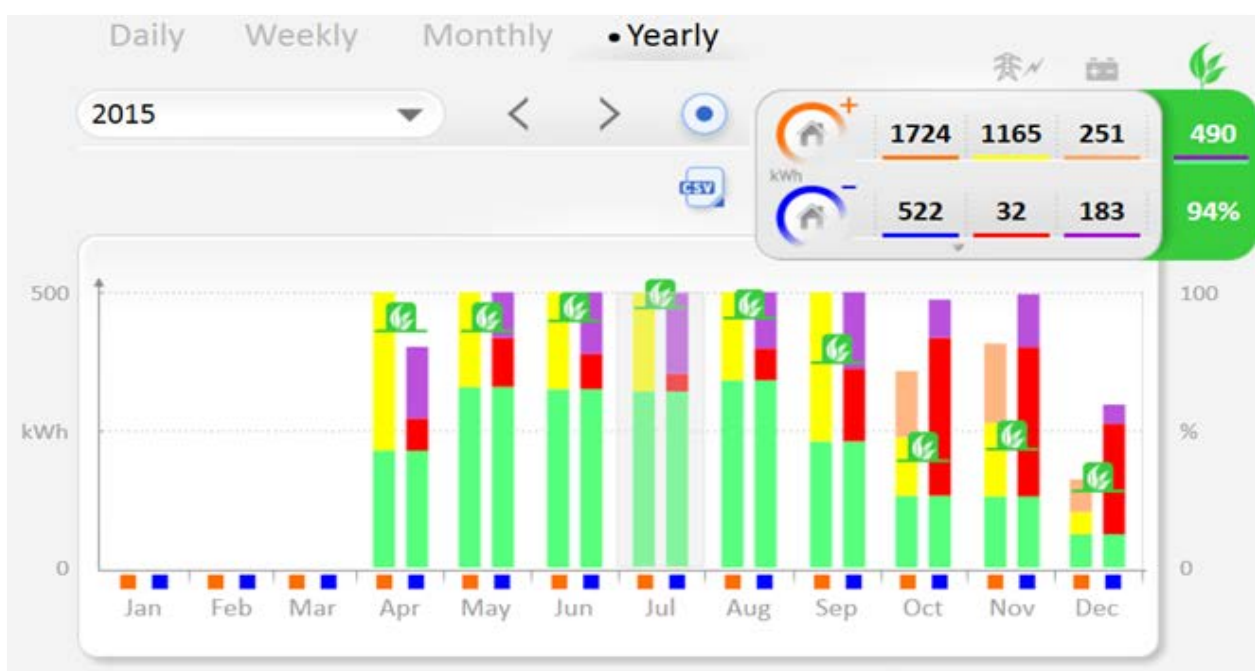


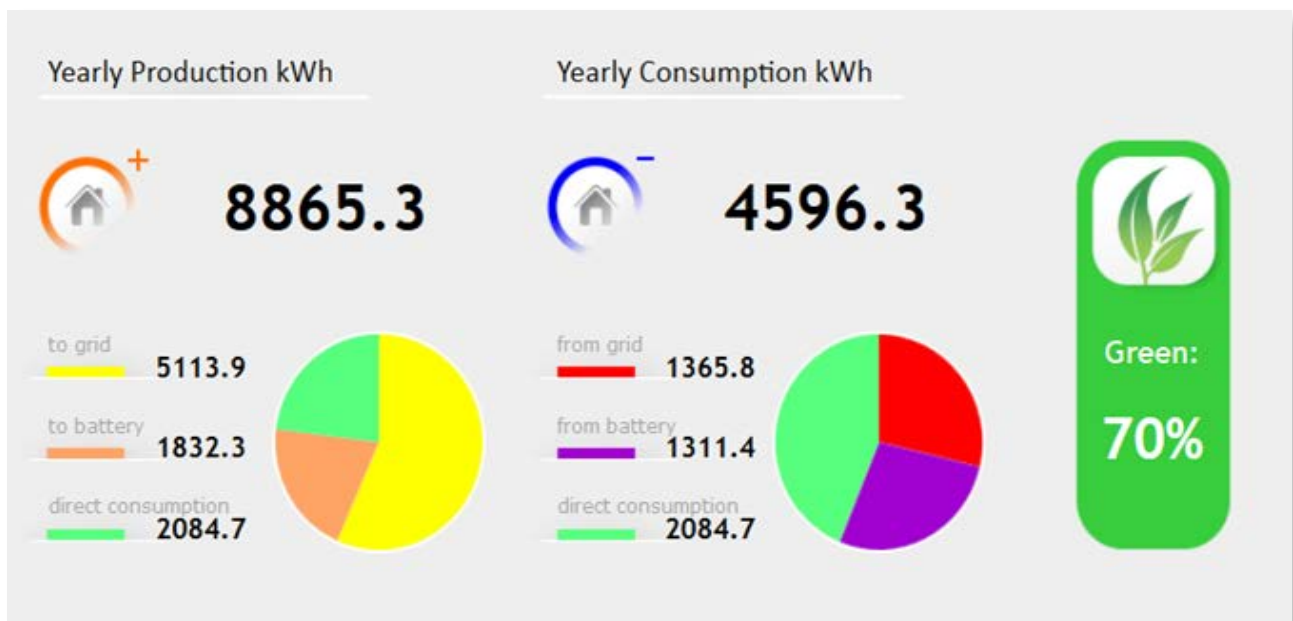


Multi apartment house in Germany, reconstructed for new energy model with renewable energy sources

### 2.5.2 NEDO SMART GRID PROJECT, Slovenia (2017-2018)

This is a smart grid demonstration project, where a the next day's electrical consumption is forecasted for specific grid segments. In case of grid limitations, a critical peak tariff is activated for certain periods of time, thus motivating consumers to reduce their consumption. Robotina delivers integrated Home Energy Management Systems (HEMS) for residential owners, which synchronize with critical peak information and automatically lower the consumption to the minimum acceptable for the required comfort and safety. The house owner takes advantage of being able to adopt a dynamic tariff, not sacrificing his/her comfort at the same time.





### 2.5.3 ENERGIE GRAZ, Austria (2018)

New energy regulations in Austria (2018) promote installation of renewable energy sources in multi-apartment buildings. A company can invest into rooftop photovoltaic plant and a battery storage system and attract apartment owners to use green energy. Based on its standard HEMS product, Robotina developed a dedicated solution to enable the provider with accurate real time information on energy usage and the division between different energy sources (PV, battery, grid) in time. This new model of energy supply will enable a more ambitious shift into renewable energy sources.

### 2.5.4 ENERGY STORAGE SYSTEMS, Germany, Austria, Switzerland, South Africa (2016 and ongoing)

Our eSTORE, energy storage and management system, helps thousands of users to reduce their energy expenses and increase autonomy. Owners of the Photovoltaic Plants (PV) generate their own energy, but often they are not able to consume it, so they have no other option than to sell it to the Utility Company. Payment for such energy is minimal, several times lower than the energy price, when the same user is forced to buy it from the same utility company. With our smart energy storage and HEMS, users can store their green energy in an eSTORE and use it when needed. In addition, HEMS controls their energy flow and optimizes it. Users enjoy savings and can control their energy flow.





## 3. INDUSTRY INSIGHT AND THE OPPORTUNITY

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Our society is in the phase of **digital transformation**, a process, which is changing it as deeply and widely as never before. Energy chain and electrical grids are not an exemption, even more - they are the driving force of changes.

Dramatic changes in our energy “picture” happened over previous years and will strongly continue in the next decade. Introduction of renewable energy resources, like usage of solar, wind and other green technologies and the reduction of traditional “dirty” sources like coal or nuclear, contributes to higher and less predictable fluctuations in overall energy production. Utility companies and grid operators, which must keep the grid stable by matching the consumption and generation at any time, encounter technical and financial challenges to execute this essential task. The coming of mass introduction of **electrical vehicles**, which need fast recharging, will further destabilize the grid and increase the cost to meet this growing demand.

To summarize, pain is the most important generator of changes and actually, the pain is already severe because of:

- Growth of energy consumption;
- Continuous increase of energy costs;
- Increased costs for grid stabilization due to usage of renewable energy;
- High costs and time to implement new infrastructures;
- Need to preserve the natural environment.

**To sustain our actual standards of living, we must reduce (per capita) and shift (in time) the consumption of electrical energy.**

The task is challenging and until recently, the only way to keep the grid stable, was using expensive energy sources (gas fired power plants) when extra power was needed, and to virtually burn the energy, in case generation happened to be higher than consumption. Now, for the first time in the history, huge optimization is possible, without wasting precious resources, because the two critical conditions: (1) legal and social acceptance and (2) technology are ready and available.

### 3.1 LEGAL AND SOCIAL CONDITIONS

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Legal and social conditions are among the most critical. Facing digitalization, our society has to pass through several phases. We had to accept that computers became very important. We have let them care about our communications, security, safety, wellbeing and more. We carry connected devices with us and share important personal data over social networks and the internet. Digital technology is transforming every part of our society and it is widely accepted as a fact.

The outlook of the most important legal and social factors, which are in place:

- Deregulation in the electrical supply chain enabled separation of roles, removed monopolies and opened the market;
- Legal framework forced deregulation and created an organized, structured and democratic energy market;
- Commitment by most countries to reduce CO<sub>2</sub> emissions and to reach significant proportion of renewables in their energy portfolio;
- Wider acceptance of connected devices, including smartphones and IoT;
- Digital transformation in all parts of society.

Society accepts and understands important and dramatic changes and so does business. New, previously impossible business models have conquered the world<sup>6</sup>. Sharing and collaborative economic business models, which use platforms, are the **most successful**.

## 3.2 TECHNOLOGICAL DEVELOPEMENT

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Finally, technology is the enabling condition and occupies the central role in these new business models. The following technologies are necessary to achieve the digital transformation and to realize our project:

- Internet Of Things (IoT);
- Blockchain and Smart Contracts;
- Artificial Intelligence;
- Efficient battery storage;
- Cloud computing and big data.

In future, business will need to rely on the above-mentioned technologies to be successful.

### 3.2.1 INTERNET OF THINGS (IoT)

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The IoT movement **represents a true digital transformation which includes the connection of things, which communicate via internet, people, processes and data throughout the value chain**. IoT comprises of **four key elements including all sorts of connections imaginable**:

- **People:** Considered as end-nodes connected across the Internet to form communities, collaborate in consumption and share information. Examples include social networks, health and fitness sensors, applications, collaborative activities and games;
- **Things:** Physical sensors, devices, actuators and other items generating data or receiving information from other sources. Examples include smart thermostats and gadgets;
- **Data:** Raw data analysed and processed into meaningful information to enable intelligent decisions and control mechanisms. Examples include temperature logs converted into an average number of high-temperature hours per day to evaluate room cooling requirements;
- **Processes:** Leveraging connectivity among data, things and people to add value. Examples include the use of smart fitness devices and social networks to advertise relevant healthcare offerings to prospective customers.

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<sup>6</sup> UBER, Airbnb, Car sharing

All four building blocks are connected locally or through the Internet. People and things have the ability to sense, decide and act. Processes ultimately follow specific targets and deliver results. The most advanced technology supports the IoT.

**IoT plays a central role in our project. IoT senses and controls our assets with local intelligence. They are connected to the cloud based services, which process the information and optimize processes to best meet the user's needs and requirements.**

### **3.2.2 BLOCKCHAIN AND SMART CONTRACTS**

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Ethereum is "turing complete", meaning it is completely functional and can perform any computation that you can do in other programming languages. Therefore it is one of the most exciting technologies in the blockchain space. This is the main reason for the Robotina development team, to select it and work on integration of the Ethereum client, which will be used to:

- Connect to the Ethereum network;
- Create new transactions and smart contracts;
- Run smart contracts.

The first smart contract deployed will manage the subscriptions<sup>7</sup>. The Robotina team and users will add further smart contracts, which will govern all the transactions.

Robotina's token is called **Robotina Utility Token (ROX)**. It is an application specific token, built on top of the existing Ethereum blockchain. **We integrated the whole life cycle of the Robotina Utility Token (ROX) inside the blockchain environment. Marketplace transactions and all the native platform benefits will evolve with time and become completely smart contract based.**

### **3.2.3 ARTIFICIAL INTELLIGENCE**

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Artificial Intelligence (AI) with machine learning and cognitive optimization is perhaps the most disruptive technology ever. Its fast development, wide availability and usability effects every process in all our activities. Development of the AI during the last few years and in 2017 particularly, has been spectacular. AI came all the way from demonstration projects in which computers won against humans<sup>8</sup>, to delivery of practical benefits in the areas of medicine, industry, environmental technologies, space, energy and many others. Development and usage of AI is growing exponentially.

**In our project, we use the AI and machine learning to build and constantly improve models, which allow us to predict consumption and we use cognitive optimization to achieve optimal results.**

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<sup>7</sup> See 5.4.1 section

<sup>8</sup> Chess, Go

### 3.2.4 BATTERY STORAGE

Developments of efficient battery storage and incredible progress in the durability of the new, modern batteries, together with cost reduction, have reached the point, when batteries became a feasible solution for temporally energy storage. Big, utility scale, storage systems<sup>9</sup> are deployed by utility companies. Households and electric vehicles (EVs) use smaller batteries, but with high numbers<sup>10</sup> they represent an important shift in the market.

**Batteries are an ideal PROSUMER<sup>11</sup>. They can store energy, when available and they can release it when needed.**

## 3.3 SMART GRIDS

Now that Europe together with most of the industrialized world, have come very far in deregulation of the electrical utility grids and energy markets, with others countries following at a fast pace, “**smart grid**” became the most important component of our energy policy, which is essential for reliable and cost effective supply.

**Smart grid** is an electrical grid which allows connection of smart meters, smart consuming devices, communication and optimization. It is one of the strongest driving forces for designing the IoT communications and control systems. It is a new paradigm of designing and operating the electrical power system with the objective to improve efficiency, enhance service quality, and to save cost in power generation, distribution, and consumption. Each smart grid system has three major components, with different functionalities:

**Power generation** - It is composed of power generators (e.g., coal, nuclear, gas, wind-powered turbines, solar power plants, hydro etc.). The smart grid enabled generator gathers costs, power demand, and prices to competitively and cooperatively adapt the power generation strategy (e.g., price and amount of supplied power in a certain time period) to achieve the maximum profit while meeting constraints on demand, capacity, and reliability.

**Power distribution** -Electrical power is delivered from generators and distributed to consumers through transmission lines and distribution stations. Power distribution has to be optimized in a way that the loss and cost of transmission are minimized. The distribution connects the power generation and consumption sides. Grid stability is essential to ensure reliable supply.

**Power consumption** - It is composed of different types of power consumers (e.g. industry, households, buildings, electrical vehicles). The power demand of consumers has to be determined so that the allocation of power supply and distribution can be performed optimally. To achieve this goal, smart meters are deployed to quickly and accurately collect the power consumption data. This data can be used to estimate and optimize the power demand.

<sup>9</sup> MWatt size

<sup>10</sup> 25.000 Home Energy Storage Systems were installed in Germany in 2017

<sup>11</sup> PROSUMER: Asset which can generate and/or consume electricity and can be controlled.

### 3.3.1 KEEPING THE GRID STABLE - CLASSIC APPROACH

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As already explained, the smart grid is a big system of interconnected generators and consumers, who are relatively independent, but connected to the same distribution grid. Generators and consumers often have conflicting interests - generators want to deliver stable output at the highest possible prices, while consumers want to be free in changing consumption and want the lowest cost.

The power distribution, which includes energy transportation and energy vendors, has to keep the grid stable by keeping generation and consumption balanced at all times. They use various methods to reach the target. How do they do this influences their costs, service quality and profitability.

Information and communication technologies are adopted into the smart grid in order to achieve balanced energy generation, distribution and consumption in a network. Energy Management System (EMS) measures the power consumption and data that is transferred from smart meters to the control centre for processing and storage. Information is used to optimize the electrical power generation.

Given the estimated aggregated power demand (estimated demand) of consumers in a serviced area, it is in the core interest of energy vendor to buy the amount of energy (power) so, that it best matches the estimated demand. This will guarantee lowest costs and best margins.

If estimated demand is higher than actual demand, the supplied power is wasted (i.e., oversupply). On the other hand, if actual demand is higher than the estimated demand, additional power supply is required (i.e., undersupply) where the power generator charges a higher price than the price in a upfront periodic contract due to the instantaneous need.

**The core interest of an energy vendor is to buy energy at the lowest possible cost and to sell it with the highest possible margin. This is only possible, if vendor optimizes the match between estimated demand and actual demand. Deviations from this have a dramatic impact on their energy costs.**

### 3.3.2 PROFIT MAXIMIZATION - CLASSIC APPROACH

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Energy vendors have developed several methods to maximize their profits. In essence, they try to pass on the pain to consumers.

Dynamic information exchange between vendors and consumers, does not exist. Classic tariff models are fixed. Such classic tariff models are based on historically observed usage patterns and are often delivered as an on-peak and off-peak tariff with fixed timings. Further tariff models in this group include "power profile tariff", when consumer subscribes to a certain usage profile and then pays extra for any deviations.

One-way solutions with utility companies being able to remotely disconnect consumer's appliances, are being used in some areas<sup>12</sup>. They have limited effect and can significantly impact on a consumer's comfort; therefore, vendors must offer significant incentives for consumers to accept this model. In addition, without smart meters, vendors are not able to forecast the benefits of such remote actions.

Smart meters may solve a part of the problem. They are able to communicate in near-real time and they can provide a two-way communication, but their functionality is limited and it is not IoT based. The main benefit for consumers is that a smart meter can deliver cost information, so consumers can adapt their consumption to minimize their expenses.

**Classic tariff models are unable to optimize the energy expenses through the value chain – from generator to the final consumer. Therefore the suppliers and consumers need to explore new, real time solutions, which communicate in real time.**

### **3.3.3 PROFIT MAXIMIZATION - MODERN APPROACH**

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Given the fact that energy vendors and consumers have conflicting interest and that dynamic communication and organized market does not exist, they have each developed their own ways to optimize their interests

Vendors invented complex purchase systems supported by software and rather primitive EMS<sup>13</sup> systems. They have invented ways to temporally store energy and deliver it when needed. They are adding various solutions but with limited success.

Consumers, on their side, try to adapt their consumption to best suit their selected tariff system. They use devices of different complexity to move the bulk of their consumption to the off-peak period. Smart grid regulations have given them a powerful tool – they can switch between suppliers easily and frequently.

Consumers and consumer organizations have started to organize themselves. They are forming permanent or temporally "cooperatives" and join forces in their negotiations with suppliers. This can help them to reduce their energy costs, but not to improve the tariff system.

Sometimes consumers are able to form so called "Virtual Power Plant" (VPP), which can temporally react to the supplier's request for changes in the momentary power consumption.

**Two groups with conflicting interests found ways to optimize them separately. Results are visible, but could become more important if consumers were able to automatically and dynamically change their power (energy consumption) in constant negotiation with their suppliers.**

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<sup>12</sup> Switzerland, Germany

<sup>13</sup> 3.3.1

### 3.4 SMART GRIDS – OPPORTUNITY

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Vendor's core interest is to generate profit from energy sales and to minimize expenses for grid stability. As already described, vendors must, to be profitable, buy energy with periodic contracts, which guarantee them the best possible price. If they have to buy the missing energy or dispose the excessive energy, this can affect their business significantly.

Unfortunately, for them, it is not easy to forecast energy consumption. Users do not ask them when to switch on or off their appliances. They simply do it.

To make things worse, solar and wind power plants inject energy into the utility grid, when the sun is shining and wind blowing. Similarly, electric vehicles will request charging when drivers connect them and this will often happen simultaneously.

In such conditions, supplier's EMS is close to useless. Advancing algorithms and using Artificial Intelligence, could improve it, but not to the level to justify the investment.

Investment in the infrastructure needed to meet the increasing demand will be enormous and probably not sustainable; therefore, the only solution is not to do more, but to do it smarter. Fortunately, the enabling conditions are finally here<sup>14</sup>.

**To achieve their targets in the form of profit and grid stability, energy vendors should establish a constant dialogue/negotiation with consumers or consumer's community to constantly optimize the match between estimated demand and actual demand. This will reduce their costs and they will share part of this reduction with consumers.**

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14 3.1 and 3.2

## 4. THE SOLUTION: IoT + AI + Blockchain

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Robotina developed and continues to develop a combination of platform and connected things, which maximizes benefits for users by smartly using power and energy trading in “smart grids”. To do so, AI patented based multi-objective optimization is the best strategy. Users’ direct benefit is reduced energy cost, improved control over their assets, and finally, improved comfort, safety and security.

Things and users connect to the Robotina Platform, which not only provides its services in real time, and with real time/real world data from IoT, but also uses them to provide real, measurable benefits to users and to the community. This brings people, things and businesses together and it offers a unique virtual community with structure, which facilitates various collaborative business models.

By doing this, the Robotina Platform provides an attractive marketplace, where businesses can access millions of connected things and users to offer various services regulated by smart contracts. The platform collects commissions from transactions on behalf of the community. Funds are used to improve the platform. Members’ benefits are explained later in this document.

The aggregated impact of users on the electricity grid is enormous and it is a source of huge power, which will be used for continuous real time negotiations with all participants on “smart grids”. This will generate important revenue and this collective power will finally work for the members’ benefits. So, for the first time in the history, the platform truly will “EMPOWER THE PEOPLE”.





## 4.1. HARDWARE COMPONENTS – CONNECTED THINGS

IoT things have the ability to influence energy consumption or production and communicate with the Robotina Platform. They are intelligent and execute their primary function, but when allowed, they also cooperate with the platform, become PROSUMERS and generate benefits for their owners and for the community.

We have developed and started marketing the following IoT things which are used in homes, connected to the platform and provide substantial benefits:

Product	Description	Start price	Available
HIQ - HEMS	Home energy management system (HW)	\$ 299	Q3/18
HIQ-HOME	Advanced smart home system	\$ 449	2017
eSTORE	Energy storage system (li-on battery)	\$ 4490	2017
IOT LINKER XL	Intelligent gateway between business buildings and the platform	\$ 2499	2017/18

All products are built by Cybrotech Ltd.<sup>15</sup> Utilising native IoT control technology and open, documented communication protocols, so other hardware manufacturers have the opportunity to build products, which connect to the platform too. Our IoT can be remotely programmed in an automatic, easy and safe way, which is a unique and necessary enabling technology.

To facilitate development of IoT things to other hardware manufacturers, our hardware components and system software are available to them together with the support of the Robotina team.

## 4.2 ROBOTINA CORE - CLOUD APPLICATION

The Robotina Platform runs in the cloud and it is available as SaaS (Software as a Service). The Robotina Core (“The Core”), has been developed, tested and implemented for data exchange, implementation of AI and supporting algorithms, data processing and storage along with real time processes. The Core has several functionalities:

- Collecting and aggregating live-stream data, sent from IoT, that contains measurements and statuses of all connected smart devices in installation sets;
- Producing data analytics and visualizations of data, presented on web and mobile applications, that provide users with an insight into their profile;
- Running AI algorithms understand data patterns and modelling of the behaviour of whole community and individual user;
- Triggers alarms and alerts, predefined and set by the user;
- Suggesting pre-prepared programs which offers a reduction of energy usage, based on user’s profile and habits;
- Supporting data mining and execution of marketing campaigns;
- Executing transactions and interacting with blockchain.

<sup>15</sup> Cybrotech Ltd. is a Company fully owned by Robotina d.o.o., see [www.cybrotech.com](http://www.cybrotech.com)

The Core is scalable and able to support several millions connected installations with the possibility to install it in parallel on several instances.

With the Initial Coin Offering (ICO) funds we plan to upgrade “The Core” and enable the platform’s infrastructure, services and applications to be extended by developing and improving the following:

- distributed data collection and sensing, where sensory information can be detected and collected from everywhere;
- global data and resource sharing, where sensory information and resources can be shared globally;
- remote and real-time data access, where recorded data can be accessed and analysed in real time from anywhere;
- elastic resource provisioning and scaling, where service users can provision and scale up and down their needed resources based on demand;
- pay-as-you-go pricing, where cloud users can request, release, and pay for resources whenever needed;
- upgrade the AI and machine learning;
- integrate blockchain based smart contracts;
- Robotina Utility Token (ROX) transaction system;
- Integrate intelligent brokers;
- Marketplace open business environment for third party business models;
- Embedded crowd funding platform;
- Advanced marketing modules.

The Core has four vertical layers

- **Aggregates:** Virtual structures, which aggregate (combine) some of the key parameters. They are interest driven and the same entity or thing can contribute their parameters to several aggregators at the same time. Our power-selling portfolio is a typical aggregate.
- **Structures:** Combinations of entities owned or managed by a single user regardless of their geographical location (portfolio, compound and similar).
- **Site/Entity:** Things at the same location (site), which represent an entity like home, building, school, etc.
- **Things:** IoT things are devices connected to the platform through the Internet described in section 4.1

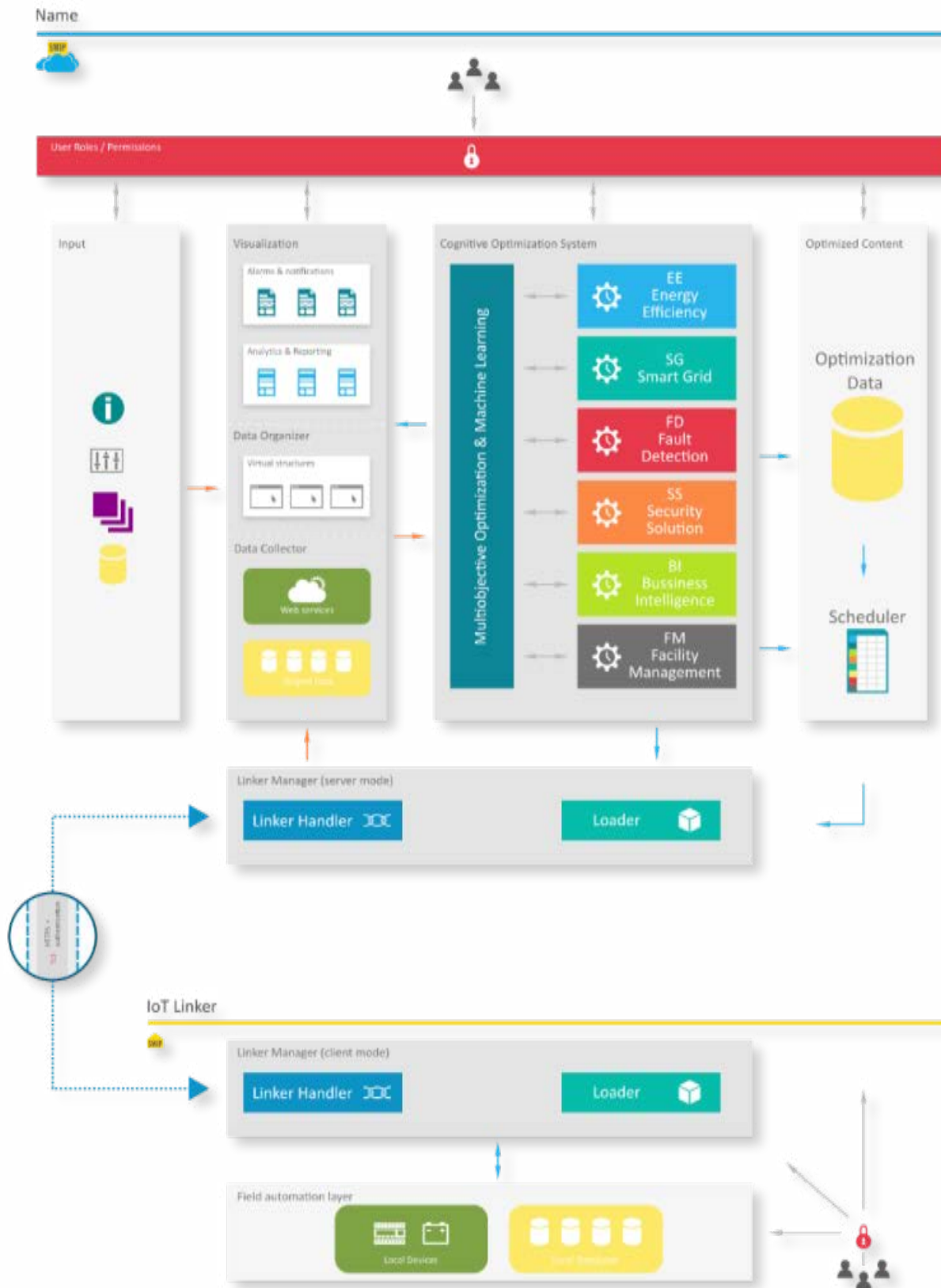
### 4.3 COS – COGNITIVE OPTIMIZATION SYSTEM

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Cognitive Optimization System (COS) is “the brains” of the platform. It uses sets of rules, which constantly optimize operation of IoT things with the target to implement a user’s strategy and maximize his/her benefits. Robotina patented multi-objective optimization dynamically finds the best compromise between various objectives. Once optimized parameters are calculated, they are transferred to IoT in a form of set points or new, optimized application software.

COS has the ability to improve itself. It uses machine learning to constantly improve models, algorithms and rules.

When external conditions, like a tariff system changes, COS and the platform expertly compile a new strategy, test it on the model and send it to the IoT things, which are immediately updated with the new situation and with the new strategy implemented.



## 4.4 WEB AND MOBILE APPLICATION - USER INTERFACE

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The web and mobile user interface applications (“The Commander”) enable the user to monitor and control his hardware (IoT) in real time and to interact with the platform.

The Commander will empower the user to:

- Know and control the details of his site (home) power requirements and energy consumption;
- Know actual energy costs and take informed decisions;
- Control all connected devices from anywhere in the world;
- Receive instant notifications and alarms;
- See and check his home remotely.

The Commander’s main function is to help user reducing his energy expenses. In addition it enables remote and automatic control of IoT things for convenience and safety/security purposes.

### 4.4.1 MONITORING AND CONTROL

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Monitoring of energy flow and status of all IoT things is already available. We are continuously upgrading this functionality. It’s main functions are:

- Smart device data: a) Which devices are on and off; b) How much energy is each one using now and in the past;
- Turning smart devices on and off remotely;
- Insights - System sends notifications of trends and negative patterns (those that may not be noticed without data analytics) to the user;
- Balance - a) How many ROX Tokens are on user’s account; b) The history of actions and purchases;
- Alerts and warnings - Which are the events that are a potential deviation from normal patterns, which are the negative patterns of energy usage. The back office also emphasises the security and safety of living. The system enables automation of alarms and warnings, relieving individual’s day-to-day life of potential troubles. While away from home, the user will be able to monitor his/her devices, to see how balanced they are or even check the log for excessive energy consumption. The system generates a notification alarm and sends it to the user via SMS, e-mail or application.

### 4.4.2 MANAGEMENT

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Account management tools empower members to execute various tasks, including:

- Robotina Utility Token (ROX) monitoring and transactions;
- Managing user’s account, profiles and allowing others to join;
- Organizing IoT things, sites and aggregates;
- Configuring and customizing all services;
- Managing COMMUNITY BOOK, publishing footprints and messages;
- Using and customizing the platform’s services and access to benefits;
- Joining groups and cooperatives;

- Participating and doing business in the marketplace;
- Interacting with the smart contracts;
- Setting up conditional rules for smart device operation;
- Managing the internal energy flow from solar panels (and other generators) internally or in batteries;
- Selecting strategies;
- Setting social activities, including donations, charity, resource sharing.
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**In short, this set of tools allows the users to manage and configure their platform.**

## **4.5 PLATFORM GENERATED USERS' BENEFITS, SAVINGS AND REVENUE**

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The Robotina platform's main task is to provide benefits to its users. The platform's native users' benefit modules help users to understand their energy profile, control their IoT things and save or earn ROX tokens (money) and contribute to the preservation of the natural environment. They are the main motivator for users to join the platform.

### **4.5.1 USER'S NATIVE BENEFITS**

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1. **Awareness** – This is the basic functionality, which will help users to understand their energy profile, consumption and production. Tariff systems and offers of various providers will be analysed and compared. Potential changes could be simulated with real data thus leading to savings that will be achieved through better information and consequent decisions. User will be able to set various alarms and notifications.
2. **Control** – User will act. By using his “Commander” application, user will access, monitor and control his things and sites through smartphone or web browser regardless of his location. He will be able to instantly change the ON/OFF status. Alternatively, he will be able to impose new rules, make other change or can set the scheduled tasks.
3. **Energy saving** – Behaviour analyses, machine learning, energy efficiency (EE) rules, weather forecast and the power of the platform will be used to achieve one task: to implement user's strategy and actively seek for best compromise between energy consumption, comfort and other objectives.
4. **Smart grids** – The ultimate PROSUMER functionality. User will benefit from dynamic energy pricing and use his IoT things and the Robotina platform to dramatically reduce his energy expenses without sacrificing his comfort. Some users' assets – IoT things, solar power plant, battery storage and even electrical vehicle - are real prosumers (they can actually produce energy). Other assets are virtual prosumers – Home Energy Management System (HEMS) and the Robotina platform will turn them into prosumers by wisely shifting their usage in time.

### **4.5.2 USER'S BENEFITS BASED ON COLLABORATION WITH THE COMMUNITY**

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5. **POWER TRADING** – User who will join the community cooperative initiative will be rewarded with ROX tokens (and money) by offering their assets to the platform initiative of POWER TRADING. The platform will aggregate users and form an enormous Virtual Power Plant, which will sell its services to various players on the grid.

6. **INTERNAL ENERGY TRADE** – The Robotina Platform will enable members of the community to sell or buy energy from other community members.
7. **COMMUNITY (CROWD) ENERGY PURCHASING & SALE** – Aggregated needs will gain bargaining power. Joint forces will enable community members to negotiate better prices and better conditions for additional savings.
8. **DATA SALES** – Platform will collect various anonymous data, which may be shared with the companies requiring it, as determined with the Platform Privacy Policy. The users sharing certain data will be rewarded with ROX tokens.
9. **COMMUNITY BOOK** – Users will publish real time data and publish their achievements, allow tailor made messages and declare their requirements. This will create a virtual, connected community with multiple benefits for users.

#### 4.5.3 OTHER USER'S BENEFITS

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10. **ACCESS TO THE PLATFORM** – Users can benefit from all businesses in the marketplace and they can actively set their cooperative, business or charity initiatives on the platform.
11. **POWER** – Community means power and power means savings and safety.
12. **OPPORTUNITY** – Users will be able to participate on the marketplace by selling or buying various services.

## 4.6 BLOCKCHAIN AND ROBOTINA UTILITY TOKEN (ROX)

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The Robotina's project includes integration of advanced blockchain technology. We will establish a Robotina an Utility Token (ROX), a digital cryptocurrency, that when used, will give a 3 % discount for all transactions with and within the Robotina platform. ROX aims to become the main cryptocurrency in the "Smart Grid" world.

This technology is absolutely necessary to create and manage the community which will be global and will form sub-communities which may be geography-driven (Europe, a city, a street) or interest-driven (power selling, community purchase etc.). It will enable the creation of a transparent, secure and distributed storage of information about transactions.

The ROX Utility Token will be an ERC-20 standard compliant token will. A limited number of tokens will be released at the Token Generation Event and they will be distributed according to the Token Distribution Plan.

We will not only create a digital coupon or voucher, but will take advantage of the blockchain technology to create a utility cryptocurrency with the purpose to become the global "Smart Grid" cryptocurrency.

The ROX token will be the exclusive community cryptocurrency for all transactions within the platform, which includes acquiring hardware and services and getting paid for contributions like usage of IoT and assets in the power trade or other revenue generating activities on the Robotina platform.

Smart contracts will be deployed for token generation events and subscription management services. Each subscription paid will get locked into a smart contract for 6 months. As the community grows, more subscriptions will be locked in the smart contract enhancing the exclusivity of further subscriptions. The platform marketplace will also enable outside partners to use the platform as a service, and deploy their own smart contracts on the Ethereum blockchain and reach out the community.

## 4.7 ROBOTINA PLATFORM MARKETPLACE

The platform will provide several benefits to the users and offer new revenue streams for the active participation of community members. The marketplace will be the central business area of the platform. All the transactions will take place in the marketplace. As already described the Robotina platform offers some native (embedded) benefits, while the marketplace provides an organized business environment, which enables users to generate and participate in different business initiatives.

ROX tokens will be used as the platform's cryptocurrency. All transactions on the platform will use ROX tokens. The electronic bank transfers in fiat currencies and other cryptocurrencies will also be accepted and automatically converted to ROX tokens using external cryptocurrency exchanges to facilitate the processes. At the beginning of platform's implementation the following sectors will be supported<sup>16</sup> on a marketplace:

- **Hardware and software e-store:** IoT things will be available for purchase;
- **Native (embedded) benefits:** Services offered by the platform, including internal trade and external data sales;
- **Cooperative:** Users and members will propose and join initiatives;
- **Business:** Businesses will be able to offer smart services based on smart contracts;
- **Social:** Initiatives to improve the community and the world.

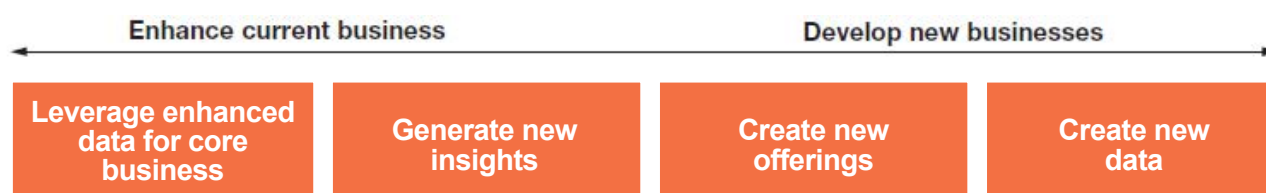
The business cycle is as follows:

Leaflet -> subscription -> delivery of service -> payment.

Revenues for the Robotina platform will be generated in several ways<sup>17</sup>:

- Subscription to the platform's services;
- Commission earned from business transactions on the marketplace;
- Participation from the quantified benefits (for example savings);
- Data (various models of selling data).

The Robotina platform's marketplace will comprise of **all sorts of connections imaginable** segmented into end-user verticals: business to business (B2B), business to consumer (B2C), consumer to business (C2B) and consumer to consumer (C2C). Such a flexible marketplace will generate extraordinary opportunities for organizations, individuals, communities and other entities to gain huge value from networked connections and connected things through services, data, processes, things and people. The platform will leverage the cognitive AI algorithms to enhance current and develop new profitable businesses in the following way:



<sup>16</sup> Details and business models are explained in different sections

<sup>17</sup> Details explained in other sections

## 4.8 BROKERS

Brokers are smart programs who deal (negotiate, exchange data) with the outside world. They consist of various rules and parameters, which are constantly improved by extensive implementation of machine learning and artificial intelligence.

Brokers will be used for automatic online negotiations with the businesses and other players in the Robotina platform, like, but not limited to:

- Grid (balance group) operators;
- Energy/power providers and users;
- Data users;
- Marketing data users (equipment and service suppliers, who need targeted data);
- Customer analytics;
- Consumer product manufacturers.

Brokers will be dynamically seeking the best deals for participating users. The engaged community will earn commission from every transaction negotiated by the broker as a reward based on their active cooperation. Brokers will be an extremely important part of the platform. We have already developed several brokers<sup>18</sup> and several more will be developed and implemented.

## 4.9 COMMUNITY BOOK

Community book is a unique interest-based social networking service with participating users, IoT things and entities. Users can divulge data, statuses, achievements and messages from the connected IoT things and entities. They can make it publicly accessible, or shared only amongst a selected group. Users can comment, send messages and express opinions

IoT things and entities, e.g. washing machine, heat pump, home, school, building, factory or others can disclose their achievements, like reduction of energy costs or becoming self-sufficient.

Users will be able to publish their interest to buy or sell equipment and suppliers will be able to send them offers, which will be fine-tuned for them.

Impact of actions and decisions will be expressed and viewed in real time with the real time data from the IoT things and entities. Calculated footprints will complement and enrich the user's experience.

**The user will have full autonomy and authority to decide what and when will be published. The community book will be the first social network, which will include people, things, entities and businesses. With multiple transactions per second, it will allow new types of social interactions and it will contribute to efficient social and business processes.**

<sup>18</sup> For example: a broker which constantly offers and negotiates possible changes in power consumption to the grid operator in the GOFLEX project.



### 4.9.1 FOOTPRINTS AND COMMUNITY REWARDS

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The Robotina platform will constantly calculate the main footprints, like carbon footprint, water footprint and other footprints for things, sites and users. Footprints will be used as Key Performance Indicators and will help in positive differentiation of users, IoT things and sites.

Community will then offer rewards in the form of ROX tokens to those, who will positively stand apart.

## 4.10 SHARING AND COLLABORATIVE ECONOMY MODEL

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Our sharing and collaborative economy model enables users to gain direct benefits; join other users to increase bargaining power when buying or selling energy or interact with businesses on the marketplace.

In our advanced sharing and collaborative economy model, which is only possible with IoT, entities structures and aggregates, connected users, who provide their IoT and connected assets to the community power-selling portfolio<sup>19</sup> will obtain ROX tokens from the system in exchange for the services that their assets contributed to the community.

Active participation in the sharing and collaborative economy model will reward community with ROX tokens in correlation with their active participation. This will allow users to be on both sides, in which they will be enabled to act as both providers and receivers of tokens from the system.

### 4.10.1 ENERGY SERVICE COMPANY (ESCO) CROWDFUNDING

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The Robotina platform's proprietary energy saving technology, which includes multi-objective optimization, energy efficiency (EE) rules, fault detection (FD) rules and machine learning helps saving energy to households and business users. The investment needed to start saving and enjoying benefits is very affordable for home and building users, so their decision is easy and logical.

Business buildings, offices, factories, malls and others facilities have huge potential for savings too. This potential is so great, that a whole new industry called ESCO – Energy Service Company has been developed offering a wide range of energy solutions including designs and implementation of energy savings projects, retrofitting, energy conservation, energy infrastructure outsourcing, power generation, energy supply and risk management (see [https://en.wikipedia.org/wiki/Energy\\_service\\_company](https://en.wikipedia.org/wiki/Energy_service_company)).

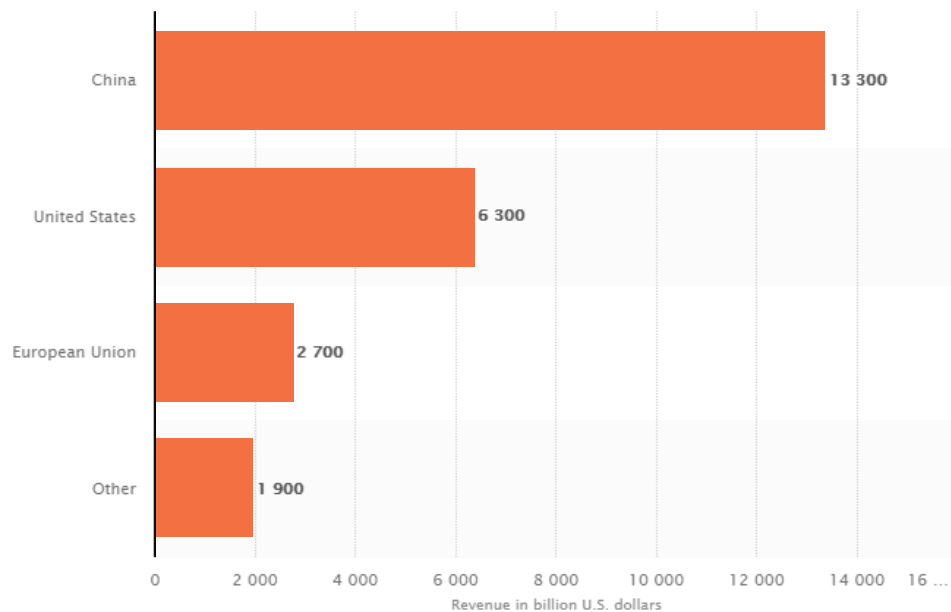
ESCO companies made fortunes due to the fact, that they provided two very important benefits:

- reduced scepticism and risk, so users' doubts about efficiency are obsolete,
- financing.

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<sup>19</sup> Power selling portfolio is an aggregate of participating connected users, who can physically contribute to create virtual prosumers.

## REVENUE OF ENERGY SERVICE COMPANIES GLOBALLY IN 2015, BY REGION (IN BILLION U.S DOLLARS)



Therefore, obviously, **energy efficiency** is realistic and its performance is good enough to **ensure benefits** for user (owner), ESCO and those, who provide financing. All of them have their costs, overheads, profits, and still ESCO model works for users. Imagine how profitable could an ESCO business be without overheads, bank fees and all unnecessary costs!

Thanks to the Robotina Platform, this is possible now. Members, who want to utilise their ROX tokens or equivalent in fiat currency or other cryptocurrencies, can contribute them in the ESCO crowdfunding. ROX tokens will be used exclusively to crowdfund the energy efficiency projects for business customers, who have a very high potential to save on energy and maintenance costs.

Unlike other ESCO's the community will protect the supporters by having buildings always on-line and the result will be maximized by including users' assets in the community power-trading portfolio<sup>20</sup> and anonymous data sales program.

How does it work?

- Customer fills in the on-line application.
- The platform evaluates (computer software and expert team) the application.
- Potential for the energy savings is calculated and evaluated. If estimated that savings are interesting, a draft proposal is sent to the customer.
- When the agreement is signed, Robotina or one of its partners delivers the necessary activities, installs hardware, connects it to the platform, configures rules and user interfaces and finally commissions the Cognitive Optimization System.
- Savings are automatically calculated and benefits are shared as per the revenue sharing model.

<sup>20</sup> Please see other sections of this document

**Revenue sharing model** guarantees benefits for the customers and supporters who have crowdfunded the venture. The revenue sharing model is fine-tuned for every case, but normally such supporters will get 78 % and customer 20 % of savings during the first three years. Afterwards savings are shared 49 % each.

The ESCO crowdfunding will enable for a sharing and collaborative economy and a democratic platform marketplace. Participation in the ESCO crowdfunding will be voluntary. The benefits will automatically be distributed on a monthly basis.

#### **4.10.2 VIRTUAL POWER PLANT (VPP) CROWDFUNDING**

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With the development of regulations and growth of utility companies and energy providers, who provide dynamic energy prices and with the need to provide secondary and tertiary reserves, power trading became very interesting business. **Virtual Power Plants (VPP)** use real and virtual **Prosumers** to offer short lasting on-request changes of energy consumption (power). This helps grid operators to stabilize the electrical grid for which they pay for.

With thousands of IoT things and connected assets, which can be temporally turned on or off on request, the platform aggregates them and can offer substantial power changes to the grid without disturbing the users. Users, who have their own IoT, can opt to be included in the power trade portfolio and to benefit from platform's VPP functionality by selecting it on the platform portal or app.

VPP provides the opportunity for those, who want to contribute their ROX tokens and for those, who are willing to provide their assets to be included in the power trade portfolio, but do not want to buy the IoT things like HEMS (Home Energy Management System) Home Controller. They will both benefit - supporters will earn money from the VPP functionality and users will be able to enjoy other benefits of having a HEMS controller and the access to the platform.

In addition, VPP will invest in dedicated prosumers, like **energy storage systems** and occasionally in renewable energy sources. Crowdfunding supporters will contribute to VPP (Virtual Power Plants) and consequently to a better and more sustainable world

## 5. COMMUNITY OUTLOOK

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### 5.1 OVERVIEW

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The platform will trigger, facilitate and stimulate formation of a community formed by members, which includes:

- Users with connected IoT things,
- Users without IoT things.

Robotina community is comprised of individual social services composed of users within each of the eight Robotina platform's products and services (this is subject to change based on Robotina sole discretion), and users who are participating in at least one of them are a part of a community. Participating members are entitled to receive reward for their active participation, from the specific social unites, in which they are participating.

The community will become an important component in the energy sector. Users will enjoy direct benefits in the form of reduced energy bill, full control over their IoT things and assets, comfort and new lifestyle, improved safety and security, and new social connections with the community. In addition to the direct benefits, the community formed on the platform, will provide users with unique opportunity to earn financial benefits. They will be able to earn Robotina Utility Tokens (ROX) by:

- Including their connected IoT and assets in the **power selling portfolio**;
- Participating in **cooperative energy purchase**;
- **Selling energy** to other users within the platform;
- Sharing **data** with the platform;
- Winning community **prizes**;
- Participation on the platform **marketplace**.

The exact benefits/rewards received by each community member will be calculated based on his or her active participation within the community (e.g. amount of data shared). Tokens provides community members with additional utility features, whereas any user will be allowed to become a member of the Robotina community regardless of whether or not he or she owns a ROX token.

The Robotina Platform will expand the community of members who will be striving to transform their households and offices (buildings) into facilities with optimized energy consumption and cost. We will help and guide the community members through the processes of:

1. Gaining **awareness** of their energy profile;
2. Establishing full **control** over appliances and their consumption;
3. Planning their **adaption** of new habits; using AI and connected things for automatic adaption to the best possible strategy;
4. Starting the **production and optimization** of their own energy; and
5. Transforming their facilities into energy **independent**, self-sustainable units.

Currently, the Robotina Community involves thousands users and we estimate that the community will scale to at least 10,000,000 members in the next 5 years. The key drivers for a successful community scale up are:

- Industry Trends - currently less than 0.1 % of all the devices that could be connected to the Internet, are connected to the Internet. Just think of the tremendous potential and limitless opportunities this brings for business and society! The IoT is going to grow tremendously.
- Penetration Strategy – with benefits for users based on the utility of the token and a huge discount on HEMS devices for ICO supporters. Other cryptocurrencies' or fiat currencies' users will be enabled to purchase hardware and enjoy benefits for the currency of their choice – however, as the ROX token represents our exclusive cryptocurrency, all commissions will be converted to ROX tokens through cryptocurrency exchanges allowing for the uninterrupted supply of ROX tokens used for community benefits stocking.
- Platform Services & Sharing and Collaborative Economy effects - has the potential to create tremendous value for both the industry and community as a whole. The platform will upgrade current processes, infrastructure and systems, and will stimulate willingness to share and collaborate across the Internet ecosystem.
- Positive feedback and scalable participation - even if users can start without connected IoT and assets, they will usually start with one or more. They will soon discover that besides gaining direct benefits, they will earn ROX tokens, which will stimulate them to connect more IoT things and earn more ROX tokens.

## 5.2 COMMUNITY ECONOMY

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The platform is designed to become the **most important sharing and collaborative economy ecosystem** dealing with the **smart grids**. As described in the other sections it provides benefits to all users and members regardless if they are individual persons with few connected IoT things or a huge corporation with several sites and thousands of connected IoT things.

**ROX token** is the platform **utility token**, which will be used in all transactions within the platform. By being the exclusive internal cryptocurrency and with all the token-related mechanisms and utilities described in the other sections, ROX token will be indispensable link between the platform and community members.

The **community** will benefit from all transactions on the platform as it will collect incremental parts from gained benefits<sup>21</sup> and use them to run the platform, provide new, more attractive benefits/ reward users for their active participation within the Platform and to finance community projects.

## 5.3 REVENUE GENERATION PRINCIPLES

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As explained, the platform is the main source of income for the community and therefore it is important to describe and understand the main business models. We predicted several models and it is impossible to predict all the revenue generation models, which are likely to develop within the Robotina platform. Models, which are a part of the platform and are detailed in this document, are designed in a way to guarantee an exponential increase in transactions leading to the whole Robotina service's growth and facilitating the wider adoption of the **ROX Utility token**

as the core Robotina currency. The platform's marketplace will be an ideal place for business initiatives to develop and grow, resulting in new businesses, which will attract new users and provide more transactions to further increase the community benefits. Whereas additional transactions will provide an increased source of revenue and different principles will provide the opportunities to users to obtain benefits/rewards through their active participation, such dynamics stimulate users to actively collaborate.

### **5.3.1 SUBSCRIPTION**

Users will pay a subscription to use the Robotina platform's services. Subscriptions will allow users to enjoy the benefits provided by the platform. Subscriptions will be low and paid **monthly** – they will generally cost **less than a price of a cappuccino**, but with number of users, which is expected to exceed 1,000,000 in the next two years, subscriptions will become an important source of revenues.

### **5.3.2 BENEFIT SHARING**

Benefit sharing is a model of choice when the Robotina platform will be used to maximize users' benefits while dealing with the outside world like utilities, energy suppliers and others. It is a good choice also when B2B customers like commercial buildings use the platform with the ESCO<sup>21</sup> model. This model applies to the platform's internal services and to the marketplace.

### **5.3.3 SALES/TRANSACTION COMMISSION**

The platform will collect sales/transaction commission for sales of hardware and from all transactions on the marketplace. It will also collect fees for fund management and other newly developed platform's functionalities.

### **5.3.4 COMMUNITY NATIVE PRODUCTS**

Besides the above described subscription, benefit sharing and transaction commission, which are by their nature typical platform fees, the Robotina platform will also generate income by selling data, e.g. community products in the form of aggregated anonymous data on power profiles, IoT things behaviour, user requirements and other general or targeted data. The community will continue developing new products and services.

## **5.4 NATIVE BUSINESS MODELS**

In this section, some of the business models, which have been developed, elaborated and embedded into the Robotina platform are going to be briefly explained. These business models have been primarily developed **for individual customers**, but their usage will be extended to all kinds of users. We expect to reach at least 1,000,000 users in two years and at least 10,000,000 in five years. All business models are shown in \$ currency for easier evaluation and connection to the real business environment. In reality all transactions within the Robotina platform will take place in **ROX Utility Tokens**. A convenient conversion from and into fiat currency and other cryptocurrencies will be provided.

<sup>21</sup> ESCO: see 4.10.1

### 5.4.1 SUBSCRIPTIONS

Subscriptions will be the most immediate and obvious income of the platform, which will be used to finance the platform's operation and to enable rewarding of the Robotina community members for their active participation within the platform.

Number of subscribed users/sites	Yearly platform income (\$)	Average monthly subscription cost (\$)
100.000	2.800.000,00	2,33
500.000	14.000.000,00	2,33
1.000.000	26.000.000,00	2,17
10.000.000	250.000.000,00	2,08

Income from subscriptions will greatly depend on the interest of users to connect and remain connected to the platform. This is why a great care has been taken while fine tuning the users' benefits.<sup>22</sup>

**SMART CONTRACT will lock in every subscription for a period of 6 months. With the growth of the community and with more subscriptions paid, less ROX tokens will remain available on the open market and more tokens will be locked in smart contracts, enhancing the exclusivity of further subscriptions.**

Months	Community	Subscriptions - 25 ROX	Smart Contract Locked	ROX Available on market
1	10000	250000	250000	570250000
2	100000	2500000	2750000	567750000
3	500000	12500000	15250000	555250000
4	1000000	25000000	40250000	530250000
5	1500000	37500000	77750000	492750000
6	2000000	50000000	127750000	442750000
7	2500000	62500000	190000000	380500000
8	3000000	75000000	262500000	308000000
9	3500000	87500000	337500000	233000000
10	4000000	100000000	412500000	158000000
11	4500000	112500000	487500000	83000000
12	5000000	125000000	562500000	8000000

<sup>22</sup> User's benefits are described in several sections

### 5.4.2 POWER SELLING-VPP

This business model is only possible with IoT things, which are connected to the platform. They are a part of the Power Selling Portfolio and, when connected to the Robotina platform they gain Prosumer<sup>24</sup> functionality. Community, VPP Crowd fund<sup>25</sup> and ESCO crowd fund<sup>26</sup> will invest to provide advanced prosumers like battery storage systems. Virtual Power Plant (VPP) is also a business model that is a part of the Robotina platform. The platform operates several VPP's and actively negotiates the best rates with utilities. The community revenue is shared between the collaborative community members, supporters and participating users, meaning the community members are awarded for their active participation within the community.

Number of participating users/sites	Yearly income (\$)	Community revenue (\$)
100.000	2.400.000,00 \$	480.000,00 \$
500.000	12.000.000,00 \$	2.400.000,00 \$
1.000.000	24.000.000,00 \$	4.800.000,00 \$
10.000.000	240.000.000,00 \$	48.000.000,00 \$

VPP income generation will grow with increased number of subscribers and with vertical business cooperative models, which Robotina and the community actively promote<sup>23</sup>. This one is probably the most unique, advanced and profitable among the business models. The community funds will provide investment into prosumers to further increase its income.

**Electrical vehicles** (EV) and growing number of **home battery storage** (like Tesla, Robotina, Sonnen, LG) will further boost this business model. Modern EV's and batteries are the best imaginable prosumers and once connected to the platform, they will start bringing revenues without further investments.

### 5.4.3 COOPERATIVE (CROWD) ENERGY BUYING

Cooperative energy buying is already practiced in limited cases in the non-connected community, but can only gain in size and importance once users with or without connected IoT unite on the platform. Aggregation, smart brokers and **blockchain** based smart contracts, which will be an essential part of the Robotina platform, will be the absolute must for this model to be efficient and profitable.

The platform will be central to the **crowd buying collaborative consumption model**. It will know the profiles of participating users (sites), aggregate them and then use **artificial intelligence** to estimate possible aggregated profiles. Then it will continuously and dynamically look for best suppliers and use its aggregated power (and bargaining power) to negotiate the best deal for the users.

The sharing and collaborative economy model, regulated by **smart contracts**, will distribute most of the negotiated savings (up to 80 %) to the participating users. The balance will be an income for the community.

<sup>23</sup> See 5.5.2



Number of participating Users/sites*	Yearly savings (\$)	Community revenue (\$)
20.000	5.760.000,00 \$	1.152.000,00 \$
100.000	28.800.000,00 \$	5.760.000,00 \$
200.000	57.600.000,00 \$	11.520.000,00 \$
2.000.000	576.000.000,00 \$	115.200.000,00 \$

(\*)This calculation estimates that only 20 % of the connected sites will participate in the group buying model.

#### 5.4.4 DATA SALES

Businesses (business customers) are interested in at least two types of data. Anonymous and aggregated data can help them to improve their products, services, algorithms and processes. On the other hand, non-anonymous data can effectively be used for targeted marketing.

Anonymous data belongs to the community and sales of such data represents its income. We can estimate that each user will generate one \$ monthly in data value; **the Robotina community will collectively earn at least 120.000.000 \$** in the fifth year. The platform will continuously aggregate data and calculate complex real time information. Customers will buy anonymous data and information sorted and ordered according to the different criteria.

Non-anonymous data will belong to the user. We estimate that 20 % of users will allow their data to be used by the Robotina platform. The platform will sell usable information in order to trigger targeted marketing messages. If each participating user whose data are sold gets hundred targeted messages yearly at a cost of 0,1 \$, he will generate 10 \$ yearly, meaning an income of **20.000.000 \$** at the end of the fifth year. Income will be shared in equal parts between the participating user and the engaged community members.

### 5.5 PLATFORM'S MARKETPLACE BUSINESS MODELS

Although the Robotina platform will initially be focused on individual users with the sharing and collaborative economy model, companies and other business users will have a great incentive to be part of the platform. The platform and community will gain in value and benefit from the following business transactions:

- **Business to Customer (B2C):** Millions of users with connected IoT things to whom they can offer various products and services. Most services will be highly innovative and only possible with connected IoT. Platform data will help to select potential customers and offer them tailor made services.
- **Platform to Business (P2B):** The platform benefits, such as enabling energy efficiency, group buying, and power selling will result in cost reduction and efficiency improvements, which are important for every business.
- **Vertical Business Cooperation:** Various entities, like utility companies, energy sellers and others will cooperate to provide new, complex products and services.

### 5.5.1 BUSINESS TO CUSTOMER (B2C)

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We will use the following assumptions to estimate the volume of B2C business on the platform:

- Percentage of connected users, who will buy services or get involved with various providers, will be 10 % during the first year and 20 % and 30 % over the next two years;
- The income from each entitled participating user will be 20 \$ during the first year and will grow to 40 \$ during the third year.

Using the above assumptions, the volume of B2C business on the platform will reach 80 million \$ after three years, which will contribute 16 million \$ revenue for the platform.

### 5.5.2 PLATFORM TO BUSINESS

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This platform to business model opens the platform benefits to all kinds of buildings. Building owners, users and facility management companies will connect their building to the platform and gain access to all benefits, which will be available for the home users.

Home users focus on safety, comfort, cost and lifestyle. In addition to this, business users will have:

- Fault Detection (FD) and prediction to dramatically reduce maintenance costs;
- Energy efficiency rules;
- Facility management support to optimize operations;
- Dynamic Dashboards and Key Performance Indicators to understand motivate and implement the necessary changes.

All business-oriented functionalities are being continuously improved and implemented on the platform in its Cognitive Optimization System<sup>24</sup>. We have completed several successful projects<sup>25</sup> and demonstrated<sup>26</sup> that:

- Savings are real, measurable and feasible;
- Business model can generate benefits for all participants;
- Every building is a candidate for such upgrade.

In our R&D project on behaviour intelligence done together with the Institute Josef Stefan from Ljubljana (see [www.ijs.si](http://www.ijs.si)) we have built a full model and have proven 15 % savings without any substantial reduction in comfort. Our Eco-silver house project, which was sponsored, monitored and approved by the European Commission within the 7<sup>th</sup> framework program, delivered impressive results (see [https://www.youtube.com/watch?v=eeVbiqdXO\\_c](https://www.youtube.com/watch?v=eeVbiqdXO_c) or <http://www.ee-highrise.eu/>).

To estimate the potential of this business model, we have to know, that at least 40 % of world's electrical energy is consumed to "fuel" buildings. If we assume that only 10 % of all existing buildings are suitable for implementation of the Energy Efficiency and only 0.1 % of suitable buildings will be connected to the platform and the average savings will be only 10 % (we can

<sup>24</sup> See: 4.3 section

<sup>25</sup> Shopping malls, hospitals, business office

<sup>26</sup> Demonstrated means: executed, measured and verified from external institution.

expect savings >15 %), we still get yearly savings of approximately **1.200.000.000 \$** (one billion, two hundred million \$) yearly. Savings will be distributed 80 % to supporters (building owners) and 20 % to the community. The community would earn at least 340 million \$ yearly.

*The economic savings from Fault Detection and Prediction and other benefits, delivered by the platform are very similar to the energy savings; therefore, similar outcome for the community is expected. Power selling (VPP) and group buying will be used in the business environment too.*

The **ROX Utility token** will be the cryptocurrency used to pay for Robotina platform services and to pay out the benefits gained by the users. With increased business volume, which will soon become important, the ambition of the community to expand and develop the ROX token into a universal energy efficiency and power trading cryptocurrency, becomes realistic and feasible.

### 5.5.3 VERTICAL BUSINESS COOPERATION

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Vertical business cooperation between various stakeholders in the energy supply and consumption chain is natural way to “package” fully integrated solutions and offer them as a “one stop shop”. The Robotina platform will be important link of the chain, because it is the only stakeholder, which has:

- Connected users/entities with IoT;
- Important real and virtual aggregated prosumer pool;
- Ability to dynamically negotiate deals (brokers);
- Blockchain enabled smart contracts;
- Utility token ROX ;
- The Platform;
- Efficient communication mechanisms (community book);
- Data;
- Hardware, software and expertise to develop or support development on new, connected IoT things.

Robotina has already successfully delivered commercial projects, which include utilising this business model.<sup>27</sup> Value of each project and the economic outcome for community will be calculated case by case.

### 5.6 PLATFORM FUNDS AGGREGATOR

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As already explained in the 4.2 section, mutual funds will be formed and used by those, who will want to contribute their **ROX tokens into crowd funded business projects or virtual power plants**. Funds will be managed by the community through the platform. Management fees will be the community's income. The community will be able to deploy any excess ROX tokens into funds. With this activity additional income for the community will be generated.

<sup>27</sup> GOFLEX – Switzerland, Germany, Cyprus: demonstration project; SPEYER, Germany: commercial project for HITACHI; GRAZ, Austria: commercial project

## 5.7 COMMUNITY EXPENSES

The Robotina community will spend ROX tokens to operate the platform and pay for experts. Furthermore, funds will be needed to develop new functionalities and new businesses on the marketplace. ROX tokens will also be used for payments to the users and others in the shared economy model. The community will continuously need ROX tokens and will be able to either earn them or buy them on the market.

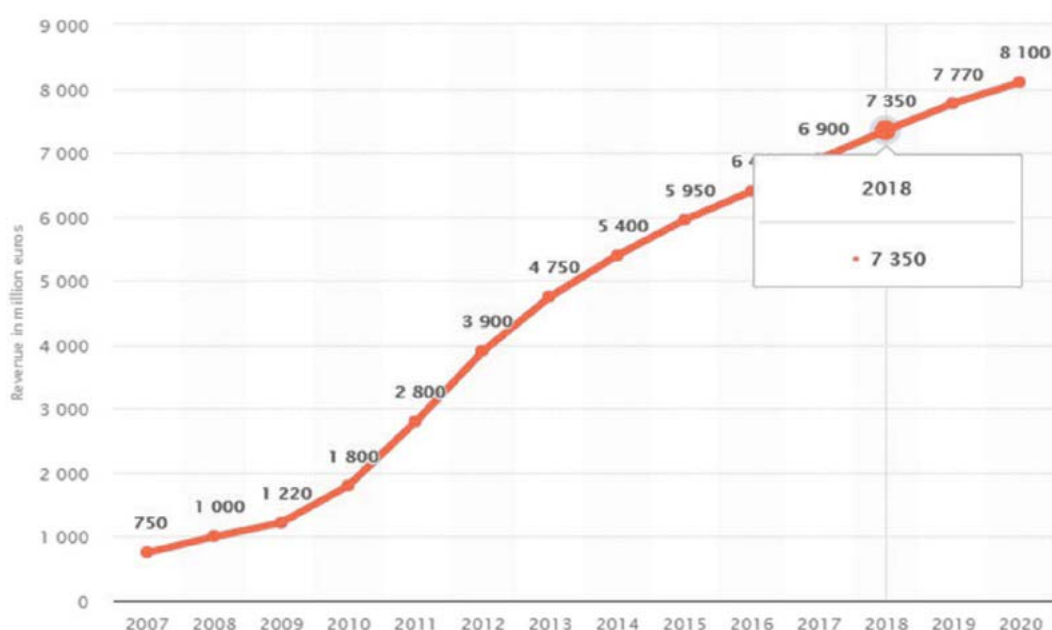
## 5.8 PENETRATION STRATEGY

We developed the complete multi-layer penetration strategy, which is facilitated by the extreme growth of the IoT industry in the area of smart grids. A comprehensive mix of marketing methods, with an emphasis on digital, will be applied to ensure fast and efficient market penetration.

### 5.8.1 IoT INDUSTRY TRENDS

The majority of people (87 %) have not heard of the term 'Internet of Things' (IoT) while the IoT industry is growing by around \$450 Billion in revenue each year and is currently worth 7.35 Trillion \$. In what might be the most obvious prediction of the decade, the IoT will continue to expand over the next 5-10 years, with more and more devices coming online every single day.

The smart grid is one of the strongest driving forces for designing the IoT. It is a new paradigm of designing and operating the electrical power system with the objective to improve efficiency, enhance service quality, and save cost in power generation, distribution, and consumption. It is estimated, that 34 % of all IoT industry revenue been generated is by the smart grid community.



## 5.8.2 INITIAL FAST GROWTH PROGRAM

The Robotina project will allocate a part of the collected ICO funds to develop a community and **distribute first 2,000 basic HEMS (Home Energy Management System) claimed<sup>28</sup>, FREE OF CHARGE, other 198,000 at discounted price to the ICO supporters.** After the collection of the funds, 200.000 installation sets will be paid for in order to expand the community. When the user will register using the back office application, he will receive the HEMS on a “first register, first received” basis. One member, one profile, one HEMS.

HEMS	# devices	Price	Discount	\$ Tokens
2,000	2,000	/	100%	\$0
200,000	198,000	50%	50%	\$149
all	all	100%	0%	\$299

## 5.8.3 PLATFORM SERVICES - SHARING AND COLLABORATIVE ECONOMY EFFECTS

Expanding the sharing community by commercialization of smart devices and services is the central pillar for designing our business model. Besides the energy optimization and savings of up to 30 % in costs, some of the future members will be able to get the free installation of their device. The Robotina Platform will change the energy consumers' habits and drive new consumers to switch their behaviour and energy providers.

Robotina will change the perception of the energy markets in households and show them a path to real or virtual energy independence. The ultimate goal is not to achieve a zero energy house, but to achieve a **zero energy cost home**. This is achievable and it will be even possible to earn money by consuming energy.

Artificial Intelligence driven services will generate value for community customers by reducing their energy costs, generating revenues and providing them with tools for greater control over their energy use. Robotina's predictive analytics and machine learning will provide data and diagnostic insights for robust and efficient facility energy management.

## 5.8.4 BUSINESS MODEL - WAY TO THE MARKET

As Robotina we use our existing distributors, resellers and system integrators to build first hand experience and to achieve initial sales. In this way, we have successfully sold several systems in more than 25 different markets across the globe. This model served perfectly in the early phase, but it is necessary to adapt it now, when we are ready to enter the next phase of rapid expansion. **Online to Offline (O2O)** business model will prevail with private (non-business) users. Digital, online marketing will be the main form of getting the message to consumers. We will use all marketing

<sup>28</sup> Within 90 days after ICO

channels and we will widely support content and no-marketing methods. The platform itself will have built-in marketing tools. We will also deploy other forms of digital marketing too. **O2O** business model assumes online sales and offline delivery & installation. **TRAINED PARTNERS**, selected third party installers and system integrators will execute the offline part.

Observed from Robotina viewpoint, the O2O business model is a specific combination of B2C (online) and B2B (offline). Many of our installers and system integrators will also become **resellers** of our **IoT things**. This will increase sales and contribute to faster expansion.

**The O2O business model will greatly contribute to a faster growth. On-line sales will be marketing driven, while off-line sales will result from various small businesses and entrepren\$ initiatives, which will help us to reach our market penetration goals quickly.**

B2B depends on marketing and direct sales. In the B2B business, we will upgrade and enhance our existing network of B2B partners.

### 5.8.5 PENETRATION PHASES - ROADMAP

While designing our penetration strategy and deciding geographical priorities, the following key factors have been considered:

- 1) **DEREGULATION OF THE ENERGY MARKET:** Regions with deregulated markets and high acceptance of smart grids together with well differentiated roles will be prioritised.
- 2) **EASY PENETRATION:** Markets, where we are already present and markets with existing Robotina partners, rank high in this classification. Additionally, favourable regulations boost this parameter.
- 3) **MARKET SIZE:** The bigger the market is, the lower will be the relative investment.

We have multiplied criteria 2 and 3 - (2\*3) and then checked this against the 1<sup>st</sup> criteria. Finally, the following markets have been ranked and organized in the following table:

2018	2019	2020	2021	2022
Slovenia	UK	Japan	US	Russia
Germany	rest of EU	South East Asia	Canada	Rest of the World
Austria	Middle East	China	Australia	
Switzerland	India	South America		
Cyprus	Indonesia			
Netherlands				
UAE				

## 5.8.6 SALES AND MARKETING - A ROADMAP 2018

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Marketing and sales activities are key to the success and they have to be planned upfront. We are ready to start an aggressive sales and marketing campaign in 2018. The following key milestones will be:

- 1.) Digital Transformation Event, Ljubljana, 30. 01. 2018
- 2.) New web site, start of digital marketing, presale: February 2018
- 3.) Light & Building Exhibition, Frankfurt, Germany: March 2018
- 4.) ICO: March 2018
- 5.) Active digital marketing: February – December 2018
- 6.) "Innograd" conference, Belgium: May 2018
- 7.) Roadshow, Central Europe: Q2/2018
- 8.) Roadshow, UAE: Q3/2018
- 9.) GOFLEX project finalization: Q3, Q4/2018

We will participate to several other conferences and events across the globe.

We will address B2B vertical markets and talk directly to the distributors in various countries. They are not part of the platform, but they may use platform's services.

We will address B2B ESCO and energy efficiency markets through existing partners and through marketing channels.

Internet based training platforms will be used to deliver our presentations, education and other messages, mostly in the form of video presentations. Interactive communication will improve user's experience and boost efficiency.

## 6. KEY GOALS, OBJECTIVES AND ROADMAP

- If Soft Cap reached

- *If 20Mio Reached*

- If Hard Cap reached

Timeline	IoT Platform	Hardware - Things	Key Benefits	Platform users
2018 - Q3	- Upgrade design - HEMS USER - Live for Beta users	HIQ - Home	Tokenize the platform	<b>1,000</b>
2018 - Q4	- Go live to the public - Awareness & Manual Control Implemented Strategy - self consumption	- Home Energy Management System G2 (HEMS - G2) - Individual Solar Power Plant Package - e-STORE G2 (3-12 kWh)	Start Individual Savings	<b>1,300</b>
2019 - Q1	- Prosumer functionality - Dynamic Tariff Analyzer - Optimizer - Android App G2 - Things fully supported - Interface to "IBM Watson"	- HEMS - G3 (Compact, full performance, multi OS) - Wireless Modules	AI for better results - savings and comfort	<b>5,000</b>
2019 - Q2	- Scheduler, scheduled tasks - Behaviour Intelligence "Community Book" made public - Integrated Payment Platform - iOS App G2 - Interface to "MS Azure"	Broker Phase 1	- Smart grid benefits - passive - Active negotiation (Broker) with third party	<b>45,000</b>
2019 - Q3	- Individual Negotiation - Full Smart Grid Optimizer - VPP - Integrated Payment Processing - Aggregation - <i>Interface to "Amazon Alexa"</i>	<i>HEMS - G4 (Lower Cost, Better Performance)</i>	- Active negotiation for individual benefits - Community starts offering dynamic power changes	<b>130,000</b>
2019 - Q4	- Aggregated Negotiation - Group Buying - Integrated Marketplace - Community Benefits - <i>Automatic program generation &amp; download</i> - <i>Content Marketing</i>	- <i>Broker Phase 2</i> - <i>e-STORE G2 (Lower Cost)</i>	- Community starts to earn money - Increased flexibility of strategy implementation - Power Trade & Data Sales - Smart Contracts introduced	<b>250,000</b>
2020 - Q1	- <i>Anonymized data for data sales</i> - <i>Revenue distribution calculator</i> - <i>Marketplace cooperative module</i> - Targeted data for advertising - Local energy & power sales - <u>Neuromarketing module</u>	- Integration of third party controllers	- Individual and businesses can join marketplace - Community earnings increase - Joined forces for more benefits	<b>500,000</b>
2020 - Q2	- Energy suppliers interface - <i>Dynamic supplier change</i> - <i>EV (Electric Vehicle integration)</i> - Multi-supplier - Marketplace - Smart Contracts		- Active data sales - Community earns from data sales - Platform open for business - further earnings and more services	<b>900,000</b>
2020 - Q3	- Open for Non- Energy Business, safety, security, insurance, medical, AI - <i>Internal Trade</i> - Social Service Module	HIQ Home G3	- Energy suppliers join marketplace - Community earns more commissions - Community starts trading with non-energy business - Totally new services offered by members or business	<b>1,750,000</b>



## 7. ROX TOKEN

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**Robotina Utility Token (ROX) is a utility token that will tokenize the Smart Grid Community and secure 3 % discount in the Robotina platform marketplace.**

ROX will be an ERC-20 standard compliant Ethereum Token, that will be established with a smart contract, deployed on the Ethereum Network. ROX will have some additional features that extend the basic ERC-20 standard functionalities. All smart contracts, correlated and developed for ROX utility token or to support additional functionalities, will become published publically before the deployment on the Ethereum blockchain for an open review.

As we are well aware of how important it is to provide seamless access to tokens, we will do our best to ensure the listing ROX token on several reliable cryptocurrency exchanges. There will be no limitation to the number of tokens owners can send or use for the purposes, described in this document.

With the ownership of the token one will also be able to cooperate within the Robotina community and as such become eligible to earn certain benefits, in correlation with their active participation. The idea behind the integration of ROX tokens is allowing Robotina to reward community for their cooperative behaviour. Consequently, any uncooperative ROX token owners will not become part of Robotina community and will not be entitled to obtain any benefits at any time. Furthermore, the ownership of ROX tokens will not entitle owners to dividends, royalties or any other amounts as share of platform's or community's future revenues in whatever form.

Token Generation Event ("the Issuance") will occur right after the deployment of the initial Smart Contract.

### 7.1 ROX TOKEN MODEL

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#### **One-time Issuance**

All ROX tokens will be issued at the Token Generation Event. Smart contract will not enable later issuances. There will be no staking or similar mechanism to increase the number of tokens in circulation.

#### **No burning/destroying/permanent locking**

There is no process to destroy or permanently remove Tokens from circulation. Tokens can be locked or vested for a predefined number of blocks (or time).

#### **Dilutable**

There will be 8 decimal places, so the smallest quant of the ROX token is  $10^{-8}$  ROX = 0.00000001 ROX.

#### **Transaction Fees**

On transactions, a relatively small amount of ROX token will be deducted from a sender of the transaction. Transaction fees on the Ethereum blockchain are expressed as gas and are not subject of this document.

### 7.2 ROX TOKENS USE CASES

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ROX Utility Tokens can be obtained:

1. On the ICO in exchange for contributions;
2. At the Robotina platform where you can buy them for fiat money, purchase of an amount of ROX Tokens will be put into a member's accounts as an initial balance;
3. Purchases on the secondary markets via online crypto exchanges, if available.
4. As community rewards for active participation (see user benefits)<sup>29</sup>
5. As a result of business activity on the Robotina Platform
6. In exchange of green certificates (CO2 coupons) or transferable tax benefits
7. As a result of ESCO or VPP crowdfunding platform initiatives
8. From the Bounty Fund

By registering on Robotina platform, users will receive a Platform Account. Some transactions that can be charged by transaction fee:

1. Transactions - outgoing transactions on Ethereum blockchain, with underlying execution of blockchain smart contracts;
2. Participation actions, triggered by the member, that require ROX Tokens:
  - Subscriptions
  - Sharing collaborative economy activities
  - ESCO fund participation
  - VPP pool participation
  - Group buying
  - Peer To Peer Power Trade
  - Business initiatives on marketplace
  - Voluntary donations
  - Hardware purchases
  - Charity activities

ROX token owners who will receive tokens on ICO in exchange for their contributions, will either:

1. Keep ROX tokens on their Ethereum address, or;
2. Transfer them to online cryptocurrency exchanges in order to trade them (if available), or;
3. Transfer them to the Robotina platform where they can be used to perform actions, which require spending ROX tokens.

## **7.3 ROX TOKENS CONSUMPTION**

Members of Robotina platform community will have several options to use their ROX tokens through the power platform application:

- Subscriptions - A required amount of ROX will be charged from the user application account. Servers that receive and execute subscriptions, will also generate a transaction that deducts ROX Tokens from the corresponding member's account.
- Upgrading the HEMS set - The shop will allow members to order additional smart devices (e.g. switches and sensors) in exchange for ROX Tokens.
- Obtaining analytics and statistical data - Different aggregated and processed statistical data in anonymous form will be obtained about electricity consumption and patterns, electrical devices, sensor readings, etc.

- Activating alarms and scripts - User will be able to choose between several additional functionalities, such as sending warnings and statistical data via e-mail and SMS, or receive live stream of data. Some scripts might analyse unexpected behaviour of electrical devices, such as malfunctions or poor efficiency. It will also be possible to trigger random events, like switching lights on at a specific time frame when on vacation to mislead potential burglars.
- Aggregated actions - Users will be able to activate a set of participation funding cases and participate in smart grid and business ventures offered on the power platform.

All ROX transactions will deduct different amounts of ROXs from the platform. When the balance of ROX tokens on the members account is insufficient, the transaction will be denied.

## **7.4 PAYMENT PROCESSORS**

Members will be able to acquire ROX tokens in the Robotina apps with fiat currencies, credit cards and other cryptocurrencies. The Robotina Platform service will do its best effort to integrate a solution linked to secondary markets (online cryptocurrency exchanges) and provide members with a convenient way to access ROX tokens. All purchased tokens will be credited to the account of the member, allowing him to use the tokens directly after the purchase.

## **7.5 ROX TOKEN LEGAL STATUS**

ROX tokens represent a proof of membership within Robotina platform. They do not grant ownership rights to Robotina proprietary software, algorithms, and other intellectual property. Furthermore, ROX tokens do not give its owner any kind of share or equity in any of Robotina legal entities, and do not entitle the ROX owner to dividends or profits of any kind. ROX token is not intended to constitute a security or any other form of regulated financial instrument. The legal nature of ROX token will be further described in "General Terms and Conditions."

## **7.6 BOUNTY FUND**

The Bounty Fund will collect and distribute ROX tokens, received from token allocation event. Each Bounty Fund participant will get rewarded with ROX tokens from the Bounty Fund for social media actions, such as promoting a crowdsale until it finishes.

### **Bounty Fund Manager**

The Robotina Project will manage the Bounty Fund and report periodically about the ROX tokens balance to all community members. Reports will be available on the Robotina's official social media pages.

### **Beneficiaries**

Members, that:

1. Agree with General Terms and Privacy Policy;
2. Register as Bounty Members.

### **Distribution**

ROX tokens from the Bounty Fund will be periodically distributed according to Bounty Fund Plan.

## 8. INITIAL COIN OFFERING (ICO) - CROWDSALE

### 8.1 WHY YOU SHOULD SUPPORT ROBOTINA?

A public Initial Coin Offering (ICO) will take place in order to collect subscriptions from supporters and to award them with ROX tokens.

#### TOKEN GENERATION EVENT

All tokens sold will be generated after the ICO (1st May, 2018). Later issuances will be disabled in the smart contract for ever.

#### TOKEN DISTRIBUTION

When issued, ROX tokens will be temporary locked until the end of the ICO phase. After the successful ICO phase, ROX tokens will be distributed to registered Ethereum Addresses, according to the following Token Distribution Plan:

- **70 %** (570,500,000 ROX) among ICO supporters;
- **10 %** among Team Members and Advisors;
- **7 %** - Marketing and promotion;
- **5 %** - Angel investors;
- **3 %** - Bounty Fund;
- **3 %** - Market and product development;
- **2 %** - Escrow.



Tokens for Team Members, Advisors and Business Partners (10 %) will be vested for a period of 6 months - they will be unable to move or sell their ROX tokens. After this period the ROX tokens will gradually be transferred to Team Members and Advisors - each month 10 % of initially vested amount.

#### PRE - ICO START

Planned on February 21, 2018, 3:00 PM CET.

#### ICO START

Planned on March 21, 2018, 3:00 PM CET.

#### PHASES

There will be 3 crowd sale phases:

- (1) Pre-ICO Limited Priority (maximum 4 weeks - until March 21, 2018, 2:59 PM CET);
- (2) ICO - Unlimited Priority (lasts until this phase's Hard Cap is reached);
- (3) Unlimited Unlisted Phase (lasts till ICO Total Hard Cap is reached or April 30, 2018, 2:59 PM CET);

First two phases are reserved for individuals, enlisted on the Priority List.

## **PRIORITY LIST**

Early supporters, that already showed an interest to participate in the crowd sale, will be added to the Priority List. All other interested individuals will have an opportunity to register on the Priority List with their Ethereum addresses, giving them the possibility to participate in the first two ICO phases (Limited Priority and Unlimited Priority). A consecutive order will be enforced.

## **CONTRIBUTIONS**

Contributions will be collected in Ethereum (ETH). Swap ratio between ROX token and other cryptocurrencies will be determined and fixed during a period of each crowd sale phase, based on average market value of each cryptocurrency – an average market exchange ratio will be used for the calculation of subscription value.

Minimum subscription is set to 0.5 ETH of value.

## **MINIMUM COLLECTED VALUE - THRESHOLD FOR SUCCESS**

Minimum value of all contributions is set to 10,000,000 \$. If this value is not collected at the end of last ICO phase, all contributions will be reimbursed to supporters, less transaction fees which will be deducted.

## **HARD CAP - MAXIMUM CONTRIBUTION SUM**

Maximum collected value is set to 28,500,000 \$. In case the total value exceeds this limit before the end of ICO, the ICO will be suspended and a calculation phase will start. After reaching the Hard Cap, no further contributions will be accepted, resulting in returning all contributions to the originating ETH addresses.

## **ICO MECHANISM**

For contributions in ETH, server-side technology will collect the amounts, send them to collecting address and calculate the ROX acquired by the subscriber based on his donation. The collecting address will be publicly announced on the Robotina ICO official web site.

## **PHASE CAPS**

Each phase is limited with it's own cap:

1. Limited Priority - 15,500,000 \$
2. Unlimited Priority - 7,000,000 \$
3. Unlimited Unlisted Phase - 6,025,000 \$

If the sum in value of contributions, received at the time of Limited Priority, exceeds the phase cap, that phase is automatically concluded and later contributions are returned to corresponding senders' addresses.

## **TRANSFERS TO LATER PHASES**

In case those contributions in that particular phase do not reach the phase cap, the shortfall in value will be transferred to next phase, along with not-distributed tokens. Due to this transfer, the ICO phases can expand in value and dedicated tokens.

## **BONUS PROGRAM**

Contributors in the Limited Priority Phase will receive bonus of 10 % and in the Unlimited Priority Phase will receive a bonus of 5 %.

No guarantee is given, that all contributors will receive bonuses in tokens, as phases are limited in value and consecutive order of contributions is respected. If the total sum value of contributions will exceed a limitation, first received contributions (15.5 mio. \$) will receive a 10 % bonus and later received contributions will receive 5 % or 0 % bonus.

However, no guarantee is given that all the subscribed supporters will get through, since the overall hard cap is set to 28.5 million \$ which equates to 570,500,000.00 ROXs.

## UNSOLD TOKENS

Potentially unsold tokens reserved for crowd sale will never be created.

## EQUATION FOR ESTIMATION

To calculate the approximate number of ROX tokens you can expect to receive the following equation sets this out. This equation **does not** respect all possible potential outcomes during the sale, such as splitting of a single contribution, phase transfers or partial haircuts. It should not be used as a guarantee of actual ROX tokens to be received or an exact calculation but for guideline purposes only.

$$\frac{\text{Value contributed} * (1 + \text{bonus})}{\text{Total ICO Value}} * \text{ROX issued for sale on ICO} = \text{ROX received}$$

### Example:

A supporter sends in ETH an amount worth 400,000 \$ at the time of contribution. His subscription is successfully accepted during the Limited Priority phase (with 10 % bonus).

Value contributed: 400.000 \$

Bonus: 10 % = 0,1

Total ICO value with bonuses: 30.425.000\$

All Tokens issued for sale on ICO: 570,500,000 ROX

$$\frac{400.000\$ * 1.1 \text{ (bonus)}}{30.425.000\$} * 570,500,000 \text{ ROX} = 8,250,451 \text{ ROX received}$$

ROX PRESALE PRICE	ROX ICO BONUS PRICE	ROC ICO NO BONUS PRICE
\$ 0.04848219265	\$ 0.05079086849	\$ 0.05333041192

## CALCULATION AND HAIRCUT

After the conclusion of the ICO phases, a calculation of all the payments, bonuses and corresponding ROX tokens will be carried out. A haircut process might follow: the contributions collected in the last effective ICO phase might not be fully accepted, part of a contributed value might be returned to contributors and will not be swapped for ROX tokens.

## 8.2 HOW TO PARTICIPATE IN A CROWDSALE

All interested individuals will be able to participate in the ICO, either during the first two Limited Phases or later on during a public phase, if the ICO will does not end early due to the hard cap limitations. Interested individuals are encouraged to pay as soon as possible after the ICO starts, due to the possible reduction of the ICO period. Failure to subscribe in the ICO period will mean that you do not receive ROX Tokens.

A smart contract Ethereum address for ETH contributions will be publicly published on the official Robotina website [www.Robotinaico.com](http://www.Robotinaico.com)

A contributor in ETH will have to transact Ethereum (ETH) from a private Ethereum address with full access, i.e. not from the online cryptocurrency exchange account. After the end of the ICO period, calculation and haircut period, you will receive a corresponding amount of ROX tokens on the same Ethereum address, from which you contributed.

Additional step-by-step guides for different Ethereum Wallets will be available on the Robotina ICO website.

### 8.3 ALLOCATION OF CONTRIBUTED FUNDS

- **27 %** - Platform development
- **23%** - Sales & marketing
- **16%** - IT Security and compliance
- **14%** - Operation cost
- **10%** - Legal expense
- **5%** - Hardware development
- **5%** - Strategy development



### 8.4 SECURITY

Robotina will follow rigid guidelines of internal and external compliance to influence industry practices and establish itself as the credible Smart House Community in the blockchain industry.

All digital assets under Robotina's ownership will be distributed among different multi signature wallets. None of the wallets or transactional accounts will have a single point access. Access will be distributed and rotated in accordance with internal compliance factors. None of the wallets or transactional accounts will hold more than 10 % of the total assets. Recovery phrases and key access codes will be secured at the designated bank without a single person having access. This will be further clarified in the "General Terms and Conditions".

Security guidelines will include, but will not be limited to: performing internal compliance checks, monitoring of effectiveness, eliminating one-point access to the running of data algorithms and stored assets, performing a third-party audit report, ensuring the integrity of data sources, fulfilling of background checks for business partners, transparency of accounting figures, and disclosure of private holdings or other decision influencing factors.

Robotina will have an independent auditing process, which will be performed by a third party on an annual basis. The report will cover:

- Stated balance in terms of assets at fund inception;
- Overview of placed, burned, and executed transactions;
- Community effectiveness and proposed optimization strategies;
- Evaluation of compliance procedures and identified shortcomings.

The third party auditing company will be disclosed via a press release before the inception of the Robotina platform.

## 9. EXECUTIVE TEAM, ADVISORS AND CONTACTS

The executive team and advisors are driving force behind Robotina's business development.

### 9.1 EXECUTIVE TEAM

#### Devid Palčič, CEO

Mr. Palčič, the President of the Board of Robotina. He obtained his master degree in Business Administration from Clemson State University, USA and a bachelor's degree in Electrical Engineering from University of Ljubljana. His areas of interest and expertise are control technology in interaction with humans and society. Currently, he is working on Smart City concepts, which include smart homes, buildings, energy, mobility and others. His contribution to the economy has been recognised by Chamber of Commerce & Industry of Slovenia in 2011: he was awarded for his exceptional achievements, which is the highest national business award. Devid contributed to several patents and specified more than 200 products. He serves in several boards and has promoted Companies in Slovenia, India, Singapore, UK and Dubai.

#### Milan Susman, CSM

Mr. Susman has extensive experience in working as a resident and non-resident sales executive in various markets of Asia and the Middle East. He is responsible for international sales and marketing and he contributes to the overall sales strategy.

#### Ivan Morano, CTO

Mr. Morano leads a team of engineers and programmers focused on industrial and industry-like automation. With many years of experience, Ivan has contributed to successful projects for Robotina in various industries, like food and drugs, dairy, sea ports and chemicals, to name just a few. Mr. Morano is Robotina key Industry 4.0 expert and he approves industrial automation projects.

#### Dr. Domen Zupančič, R&D

Dr. Zupančič received B.Sc. from Faculty of Electrical engineering, Ljubljana, Slovenia and Ph.D. degree in 2015 from Josef Stefan International Postgraduate School, Ljubljana, Slovenia. His research and development expertise is focused on machine learning, data mining, and energy optimization applications. Domen is our key expert in artificial intelligence and behaviour intelligence.

#### Damir Škrjanec, R&D

Mr. Škrjanec heads R&D, and is the key person for development and quality of hardware and system software specifications. He coordinates all the R&D activities. Technical competences: Software design (embedded, Windows, Linux, Android, iOS, C/C++, JavaScript, Python, assembler, PLC) man-machine interface, software engineering, embedded systems (8051 series), networking (TCP/IP, MODBUS), analogue/digital electronics.



**Davor Senjanovič, R&D**

Mr. Senjanovič holds the MS degree and been working in the field of digital controllers since 1977. Within the company, he is responsible for system software at the microcontroller level. He is expert for PLC programming and project management with detailed knowledge of SCADA systems, field buses C, Visual C#, and 8051 family microcontrollers assembly language programming.

**Tomaž Pavlica, Marketing**

Mr. Pavlica, MBA has 20 years of experience in management and international business development. His experience as marketing manager at OMC, Austria helped him to develop deep knowledge on energy markets. He led teams and projects and is responsible for change management. His expertise is in the fields of strategy development, business process optimisations, sales, marketing and branding.

**Marino Montani, QA**

Mr. Montani holds a master's degree. He is an outstanding Industrial IT Project Manager and heads the implementation and maintenance of the biggest Slovenian network of environmental monitoring IOT systems at ARSO. He is an Quality Assurance expert and an active ISO 9000 auditor.

**Andrej Pašek, Automation, GM**

Mr Pašek, executive GM of the automation group works for Robotina for over 20 years. His extensive experience has contributed to many of the key projects, including the development of the Middle East markets. Andrej has experience in system integration, PLCs's, SCADA and in other key areas for automation.

**Hubert Golle, Smart Grids, GM**

Mr. Golle heads the Smart Grids Division at Robotina. He started by introducing MES as a business unit at Robotina and continued by actively leading the Renewable Energy Division. He is focused on the Japanese and European markets. Smart Grids Division includes energy storage systems, energy management systems and IOT based remote operation. Hubert also focuses on new generation of HEMS and on Goflex projects, which will integrate smart grids in three major European cities.

**Erik Bubola, Smart Grids**

Mr. Bubola studied power electronics and he is expert in electrical energy, grids and smart grids. His main role is support and tariff systems. Mr. Bubola has deep knowledge of energy storage systems and Energy management systems and he is central to our technical support team.

**Ivan Iličić, R&D**

Mr. Iličić heads Robotina applied R&D team. He is responsible for final integrated solutions, which combine controllers, IoT linker, and Cloud software. Ivan leads important projects in Europe and Japan. He is focused on our xEMS project and on implementation of pilot COS systems and usage of machine learning in real projects.

**Arjun Upadhyaya, Software**

Mr. Upadhyaya leading software development in the Robotina Dubai operations. His main responsibility is development of SCADA (software for control and data acquisition) applications, where he has deep and extensive knowledge. Arjun's main task is to develop and integrate real time process software. He is also responsible for secure communication between IOT devices and the Platform and structure of the data matrix.

### **Armin Alagic, Software**

Mr. Alagic heads Robotina blockchain team. He is also a founder of Omnitask Limited has created team of 10+ members in various skill set including BlockChain, Smart Contract, Ethereum, WordPress, AngularJS, NodeJS and many more.

### **Igor Marić, Smart Contracts**

Mr. Marić is full Stack Web Developer with solid background in different programming areas. Igor has been strongly focused on future technology like Blockchain for development of highly secure smart-contracts, websites and control panels for smart contracts.

### **Joao Fernandes, Sales manager**

Mr. Fernandes is as a native speaker responsible for Portuguese, Spanish and English speaking markets, which include Spain, Portugal and South America. He has important international experience and he has worked as sales executive in London, UK before joining Robotina team. While working on the sales process, Joao gathers important information on customer's needs and shares it with R&D team.

## **9.2 ADVISERS**

### **Irena Linasi Rogač, Finance**

Ms. Irena Linasi Rogač is CEO of the international financial company Tim valores. She heads a team of more than 50 financial advisors and financial professionals. She has more than 20 years of relevant experience and successful track record in financial business development and become a strong business partner for remarkable Financial Groups across Europe.

### **Diego De Fecondo - security**

Mr. De Fecondo is a security expert. With his record of accomplishments as technical security advisor to the Italian Police and armed forces, his expertise and deep knowledge will be important to maintain proper security and to prevent potential threats. Diego also invented and developed to the stage of serial production, the innovative Next-tape, which is changing the electrical installations in retrofit markets.

### **Atul Kumar Gupta - UK Market & Investment banking**

Mr. Kumar Gupta has extensive experience in the role of specialized investment banking and He has invested in several technology companies around the World. He heads Robotina's UK division and is responsible for UK and international markets. With his extensive experience in investment banking; Atul will focus on the investment issues. ESCO and VPP crowdfunding pools will be coordinated by Atul. He heads the UK intelligence team, which focuses on the UK smart grid specifics.

### **Elvin Sudiro - Indonesian and South East Asia market**

Mr. Sudiro has extensive experience working as a sales executive across various markets in Asia. He is specialist for Indonesian Market where he distributes the Robotina IoT solutions. He is responsible for international sales, and is a key contributor to Robotina's overall sales. Needless to say, Elvin also focuses on gathering the market specific information.

### **Yutaka Kameda - Japanese Market**

Mr. Kameda has 20 years' experience at PV market covering all areas including a country manager of PV pane manufacturer, representative of numbers of European and Chinese panel and monitoring system firms. He has an extensive experience and expertise in Lithium ion rechargeable battery market. His major task is panel technician in due diligence at mega solar sales to overseas clients. Now he is responsible also for residential PV system sales with micro-inverter. Mr. Kameda's precious experience is crucial for development of Japanese and South-East Asian markets.

### **Sanjay Gupta - Indian Market**

Mr. Gupta is the CEO of Robotina India operations. B.E., Mechanical & MBA in Marketing & Finance with over 27 years working experience. Has worked with top Indian Corporate before turning entrepreneur 14 years back. With his experience in the cooling sector, Sanjay could ideally develop our Smart home and Building Management Systems business in India. Sanjay overlooks the growing field of BMS and energy efficiency in the market. He is also involved with energy storage, measurement and analytics, which lead in the direction of smart grids and smart cities.

### **Prof. Dr. Matjaž Gams - AI Expert and scientific advisor**

Prof. Dr. Gams is head of the "intelligent systems department" at the Josef Stefan institute. His main research areas are: Artificial Intelligence, Machine Learning, Agents, Human-aware Computing, Wearable Computing, Sensor Fusion. He is member of numerous international program committees of scientific meetings, national and European strategic boards and institutions, editorial boards of 11 journals and is editor-in-chief of the Informatica journal, published for 40 years. Each year the contributions of his team or him personally are reported in several major national TV stations or newspapers. He has been teaching 20 courses at 10 universities, including Applied University in Germany. Currently teaching Intelligent systems, Business intelligence, Cognitive science. He achieved over 10 national and international awards and published several books and over 1300 scientific articles. Professor Gams and the Josef Stefan institute and Robotina have developed long term cooperation with excellent results.

### **Prof. Dr. Jerneja Z. Gross - Scientific advisor**

Prof. Dr. Gross holds a Pd.D. degree in electrical engineering. She is full professor at the Department of Mechanics, Design and Computer Engineering of the Faculty for industrial engineering. She has a certificate for running Prince2 projects. She is an experienced coordinator of challenging domestic and international research and development projects, such as the national projects VoiceTRAN, ZEN, BMT and eBralec and three international Eureka projects. Her areas of competence include speech and image technologies, language processing, pattern recognition, biometrics, signal processing. She authored one book, co-authored five European and US patents and more than 200 technical and scientific articles

### **Dr. Mario Žganec - Scientific advisor**

Dr. Žganec received his doctorate at the University of Ljubljana. He is an experienced leader in demanding research and development projects such as InteliMO, BioID, ATRIS. He is expert on fields: information systems, signal processing, sensors, biometrics, language and speech technologies, multi-modal user interfaces, language resources, data analytics, machine vision, smart machine vision, system control, sensors for smart traffic and smart sites. Mario contributed to several patents and he has a long experience working in the research and development projects in cooperation with Robotina.

### **M.A. Elena Rutenbeck – international and block-chain related finance**

Ms. Rutenbeck is actually serving as a financial accountant and advisor in the UK Company. Elena is “IACCM, Contract and Commercial Management Certification” certified and she got her BABA from Germany and her Master of arts from Finland. Her language skills include English, German, Russian, Finnish, Polish, Swedish, Norwegian and Japanese. She is actively researching block chain related finance and its implementation in different legislations.

### **Mark Zwanenberg – Benelux and European market**

Mr. Zwanenberg is system architect, Owner and founder of OmniLAN and Rememberz companies in Oss, the Netherlands. He is Managing director / partner in the company which is developing systems for several arrears like building automation, energy transition, energy concepts, ZERO emission of buildings and processes. Mark has in depth knowledge and experience with Robotina and Cybrotech technology and products as well as relevant industry experience and market Knowledge.

### **Prof. Dr. Massimo La Scala - Smart Grids and scientific advisor**

Prof.Dr. La Scala is Full Professor of Electrical Energy Systems at Politecnico di Bari and Director of the “Laboratory for the development of renewables and energy efficiency in urban areas: Progetto ZERO (Zero Emission Research Option “. **In 2007, he received the IEEE Fellowship:** with the citation: **“Contributions to the development of computationally efficient power system dynamic performance simulation and control methodologies”.**

He has been consultant for many agencies involved in the energy business. In Italy, he has been consultant for the **Italian Energy Authority (AEEGSI)** in the committee of **national experts for the evaluation of pilot projects in smart grids** and Cassa per i Servizi Energetici e Ambientali (CSEA) about reviewing Projects under financial support by the **Italian Ministry of the Industry**. Abroad he was consultant for the Lithuanian National Control Commission for Prices and Energy and the Energy Market Regulatory Authority in Turkey. Prof. La Scala published more than 230 scientific articles.

### **Dr. Damir Ismailović - IT & Mobile**

Dr. Damir Ismailović holds a doctoral degree in Software Engineering at Technische Universität München (TUM) with a focus on software development, mobile technologies, usability engineering. In his role as a branch leader of innowerk-it GmbH, Competence Center Leader for adesso AG, research group leader at TUM, and founder of Serapion, he represents topics such as modern customization solutions, mobile solutions, Industry 4.0, IoT and modern software systems.

### **Prof. Dr. Aleš Kobal - Legal**

Prof. Dr. Aleš Kobal, is legal expert, qualified to practice Financial Tax Law . Prof Kobal graduated from law school, Ljubljana Universit. He has in-depth knowledge of Legal Methods in Informatics. Since then he gained more than 10 years of experience in practice. He is a professor of Law at the Maribor University Law Faculty. Prof.Dr. Kobal has published more than 200 scientific articles.

### **Lidija Zeme - Finance**

Experienced Chief Financial Officer with a demonstrated history of working in the management consulting industry. Strong finance professional skilled in Sustainable Development, Business Planning, Strategic Planning, Business Development, and Marketing Strategy

### **Dr. Gerhard Kleineidam – Future Energy Supply**

Dr. Gerhard Kleineidam (Competence Network Water & Energy, Hof) is an expert in systems engineering and automation technologies. He lectures “Automation in Energy Supply” and operates the field test lab in the territory of the utility and DSO SWW Wunsiedel GmbH in Northern Bavaria. He has been head of the E|Home-Center at the University of Erlangen Nürnberg before, where he has done research on smart home technologies and micro power plants. He has been CEO and founder of InReCon AG (Germany), a company developing high tech solutions in automation. Previously, he was a senior manager at Infineon Technologies for semiconductor backend automation and a project manager at Siemens Automation Group, where he was responsible for managing huge turn-key automation projects. Gerhard Kleineidam is an active member at VDE and heads the VDE working group “Energy Supply 4.0” [www.vde-nordbayern.de/ak-EV-40](http://www.vde-nordbayern.de/ak-EV-40).

## **9.3 CONTACTS**

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General queries regarding ICO: [ico@Robotinaico.com](mailto:ico@Robotinaico.com)

Potential supporters: [support@Robotinaico.com](mailto:support@Robotinaico.com)

## 10. LEGAL DISCLAIMER

The purpose of this White Paper is to present Robotina and ROX utility token in connection with the proposed Crowdsale (Token Generation Event). This White Paper is for information purposes only and it does not create any contractual relationship between Robotina and you as the recipient of this White Paper. This White Paper is not intended to be all – inclusive. The sole purpose of this White Paper is to provide reasonable information to you as a potential token holders to determine whether or not to undertake a thorough analysis of Robotina and ROX utility token with the intent of acquiring ROX tokens.

Acquiring ROX utility tokens can involve a high degree of risk and any acquirement of ROX utility token is final and non-refundable. ROX utility token does not give any rights on dividends or interest, any ownership right or stake share or equivalent rights or any right to receive future revenue shares, or any other form of participation in or relating to Robotina, nor shall ROX token holders have any voting rights, influence or rights in the development or governance of Robotina.

Nothing in this White Paper, Robotina Website and other documentation will be deemed to constitute a prospectus of any sort. ROX utility token is not an investment advice nor an investment product and any action, notice, communication, message, decision, managerial act, or omission of the mentioned shall not be understood and interpreted as such. Robotina gives no guarantees as to the price or to the value of the ROX utility token and explicitly warns users that there is no reason to believe ROX utility token will increase in price or in value, and that it might even decrease in price or in value or lose its value entirely.

You as a potential ROX utility token holder represents and warrant that you (i) understand that ROX utility token may lose all of its value; (ii) understands that price of ROX utility token may become zero, 4) are not acquiring ROX utility tokens as an investment and 5) are aware of all other risks deriving from holding and transacting ROX utility tokens.

An updated version of this White Paper may be published on a later date. Robotina makes no warranties or representation as to the successful development or implementation of this Project, or achievement of any activities noted in this White Paper and disclaimer any and all warranties in relation to the White Paper implied by law or otherwise. This White Paper is not legally binding or enforceable by you as potential ROX utility token holder against Robotina.

# 11. GLOSSARY AND ABBREVIATIONS

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## 11.1 PROJECT SPECIFIC

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### **Robotina**

Is the name of the company, domain name and brand registered.

### **Active user**

Is a user of Robotina services offered on Robotina IoT platform actively collaborating within the Robotina community. Active user is not conditioned upon holding any ROXs.

### **Community**

Is a social unit of active users of a particular Robotina platform's products and services, not limited to ROX token holders.

### **Crowdfunding / Crowdfinancing**

With an Initial Coin Offering (ICO) within the platform, supported by the community, the funds for financing equipment for larger facilities (buildings) are raised. The community is therefore rewarded on the basis of collecting the majority of the savings gained on the facility.

### **Data sales**

Data collected and processed by the platform are sold to (1) electricity distributors so that they can better plan the amount of electricity they need for their customers, (2) electricity producers, (3) advertisers, etc.

### **Group buying**

Is a collective buying, where a provider offers products and services at significantly reduced prices on the condition that a minimum number of buyers would make the purchase.

### **Marketplace**

Is shop within the platform, where the products such as an Energy Management System (EMS), solar panels, electricity, etc. are sold.

### **Participating User**

Is a user actively participating within the platform.

### **Power selling**

Platform's community members will sell power by providing on-request variable consumption to energy suppliers and grid operators.

### **Prosumer**

Is a consumer which both consumes and produces electricity.

### **Sharing economy**

Is an economic model often defined as a peer-to-peer (P2P) based activity of acquiring, providing or sharing access to goods and services that are facilitated by a community based on-line platform.

### **Vertical integration**

Is an arrangement in which the supply chain of a company is owned by that company.

## 11.2 TECHNICAL

### **Actuator**

Is a device that can turn actuate switching on or off of electricity.

### **Aggregate**

Is a virtual structure, which aggregates (combines) some of the key parameters. It is interest driven and the same entity or thing can contribute its parameters to several aggregators at the same time. Robotina's power-selling portfolio is a typical aggregate

### **Energy Storage = Battery**

Is an in-house facility where electric power is stored.

### **Cognitive computing**

Is the simulation of human thought processes in a computerized model. It describes technology platforms that are based on the scientific disciplines of artificial intelligence and signal processing. They encompass machine learning, reasoning, natural language processing, speech and object recognition, human-computer interaction, dialog and narrative generation.

### **Cloud computing**

Is the delivery of computing services—servers, storage, databases, networking, software, analytics and more—over the Internet (“the cloud”).

### **Counter**

Is device that counts and transfers count into electrical signal.

### **Dimer**

Is a device that can dim light.

### **HEMS**

Home Energy Management System – Is a central unit that communicates with energy appliances within home and with a cloud via internet.

### **Additional smart devices**

Sensor and actuators that can be connected to HEMS.

### **HEMS compatible appliances**

Appliances that have build in sensors and actuators that are able to communicate with HEMS or ROBOTINA app directly.

### **Sensor**

Sensor is the device that can transfer certain state (electric power, level of water, temperature etc.) into electrical signal.

### **Smart city**

Is a municipality that uses information and communication technologies to increase operational efficiency, share information with the public and improve both the quality of government services and citizen welfare.



**Smart grid**

Is an electrical grid which includes a variety of operational and energy measures including smart meters, smart appliances, renewable energy resources, and energy efficient resources. Electronic power conditioning and control of the production and distribution of electricity are important aspects of the smart grid.

**Smart home**

Is a convenient home setup where appliances and devices can be automatically controlled remotely from anywhere in the world using a mobile or other networked device.

**Solar Power**

Is electrical power gained from solar cells that transfer light (sun rays) into electricity.

## **11.3 CRYPTO AND ICO**

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**Blochchain**

Is a shared, immutable ledger for recording the history of encrypted transactions. It fosters a new generation of transactional applications that establish trust, accountability and transparency.

**Broker**

Is a smart program which deals (negotiates, exchanges data) with the outside world. It consists of various rules and parameters, which are constantly improved by extensive implementation of machine learning and artificial intelligence.

**ICO - Initial Coin Offering**

Is a means of crowdfunding centered around cryptocurrency, which can be a source of capital for projects.

**Floor**

ROBOTINA team estimates that the project is not feasible if less than 10 million \$ is invested. If 10 million \$ investment is not reached during the ICO - smart contract will automatically return money to investors and project will not continue.

**Haircut**

ROBOTINA aims to raise 28,525 million \$ in ICO. If person A supports the project with 1250 \$ (or equivalent in Ethereum) and the total amount raised will be 35 million \$, smart contract will accept only 1018.75 \$ (or equivalent in Ethereum) from person A and return him/her 231.25 \$

**Hard cap**

ROBOTINA team has estimated that project with over 28.525 million \$ will be too hard to manage due to demanding supply and distribution of ROBOTINA devices and due to potential lower quality of services for individuals beyond a certain scale. That is why project is limited to 28.525 million \$. Investors above 28.525 million \$ will be haircut.

**Smart contract**

Is a computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract. Smart contracts allow the performance of credible transactions without third parties. These transactions are trackable and irreversible

### Utility Token

The utility tokens are services or units of services that can be purchased. These tokens can be compared to API keys, used to access the service. They are a way to fund projects of shared infrastructure that couldn't be funded before. To enable such ecosystems to be built some tokens can be "pre-mined" in addition to be sold in "crowd-sales" during tokens launches.

### Vesting period

As part of the dedication of a team, all involved in ICO will have their tokens locked up for a year in order to avoid overflowing the market with ROX tokens, before secondary ROX market is fully developed.

## 11.4 LIST OF ABBREVIATIONS

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- AI** – Artificial Intelligence
- API** - application program interface
- B2B** – Business to Business
- B2C** – Business to Customer
- BMS** – Building Management System
- COS** – Cognitive Optimisation System
- DSM** – Demand Side Management
- EE** – Energy Efficiency
- EMS** – Energy Management System
- ESCO** – Energy Service Company
- FD** – Fault Detection
- HEMS** – Home Energy Management System
- HIQ** - A system of devices and software for home automation
- HW** - Hardware
- IoT** - Internet of Things
- ICO** - Initial Coin Offering
- NOC** - Network Operations System
- O2O** – Online to Offline
- P2B** – Platform to Business
- P2P** – Peer to Peer
- PLC** - Programmable Logic Controller
- PP** – Power Platform
- PV** - Photovoltaic
- QA** – Quality Assurance
- R&D** – Research & Development
- ROI** – Return on Investment
- ROX** – Robotina Utility Token
- SaaS** – Software as a Service
- SW** - Software
- VPP** – Virtual Power Plant
- VPPPF** – Virtual Power Plant Pool Fund

# MAKE SURE YOU GET YOUR ROX TO JOIN THIS **ELECTRIC** **(R)EVOLUTION.**



THE PRE-SALE OF ROX TOKENS GOES LIVE ON THE 21st  
OF FEBRUARY, AND THE ICO BEGINS ON THE 21st MARCH.

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CEO, DEVID PALČIČ