# Innovation Fund

# Application Form

## First stage

## Administrative Forms (Part A)
## Technical Description (Part B)

Innovation Fund Large-scale Projects

InnovFund-LSC-2020-two-stage

**Version 1.0**

**3 July 2020**

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# APPLICATION FORM (PART B)

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| **Project acronym:** | AWINGEN |
| **Project title:** | AWINGEN: Autobahn Wind Generation |
| **Coordinator contact:** | Anton Kolesnikov, AWINGEN GmbH |
| **INNOVATION FUND SPECIFIC INFORMATION** | |
| **Proposed date of Financial Close:** | 06.2021 |
| **Proposed date of Entry into Operation:** | 06.2022 |
| **Category of the project (drop down list)**<br><br>*For this and next two items, refer to Annex C to the call, Methodology for calculation of GHG emission avoidance, Appendix C1 Classification of projects into sectors* | Renewable energy |
| **Sector of the project (drop down lists)** | Wind energy |
| **Products within sector** | [product name from list: (if substitute product, indicate the product substituted)] |
| **Monitoring and reporting period** | 10 years |
| **In which Member State(s) and at which location will the project be implemented?** | Germany (as well as any other European countries that have high ways e.g. Spain, France, Italy etc.) |
| **Does the project build on prior work supported under Horizon 2020 or any other EU programme(s)?** | No |
| **Is the project co-financed by, or requesting funding or planning to request funding from other EU programmes?** | Yes<br><br>Horizon Europe (9th rp Program)<br><br>EIC Patfinder<br><br>EIC Accelerator |

## PARTICIPANTS

*Use the same numbering as in Part A of the Application Form.*

*List Beneficiaries, Affiliated entities and other participants involved in the action: associated partners, third parties giving in-kind contributions to the action and sub-contractors (see the Model Grant Agreement, especially Articles 2, 7-9 for explanation of the different roles and responsibilities)*

*Coordinator (COO) – Beneficiaries (BEN) – Affiliated entities (AE) – Associated Partners (AP) - Third parties giving in-kind contributions to the action (TP) – Subcontractors (SUB)*

| Number | Role | Name | Short name | Country |
|---|---|---|---|---|
| 1 | COO, BEN | AWINGEN GmbH | AWINGEN | Germany |
| 2 | TP | Anwaltsbüro GINSBURG, Konstantin Ginsburg | Konstantin Ginsburg | Germany |

| | | | | |
|---|---|---|---|---|
| 3 | TP | Steuerberatungskanzlei Andreas Press | Andreas Press | Germany |
| 4 | TP | M.H.V Hoch-Tiefbau GmbH, Michail Vardapetyan | Michail Vardapetyan | Germany |
| | | | | |
| | | | | |

## PROJECT SUMMARY

**Project summary**

Please include the following in the summary:

METUWAK - multi eltric turbin wind generator anton kolesnikov

pre-production segment of METUWAK 10 km long - METUWAK.10.01 + сокращения из ТЭО

## 1. Project and applicant

### 1.1 Background, objectives and impact

**Background and objectives**

*Describe the background and rationale of the project as well as the specific objectives of the project.*

*Describe how is the project relevant to the general objectives and expected impacts of the call for proposals, in particular:*

- *how does it help demonstrating highly innovative technologies, processes or products, that are sufficiently mature and have a significant potential to reduce greenhouse gas emissions; and*
- *how does the project plan to attract additional public and private resources.*

*With regard to the expected impact, describe briefly how the project will contribute to one or more of the following EU policy objectives: the Integrated SET Plan, the New Industrial Strategy for Europe and the Communication on a recovery plan for Europe, the new Circular Economy Action Plan, the shift to renewables and increased electrification, energy efficiency, the LULUCF Regulation, the EU Biodiversity Strategy for 2030 and the Bioeconomy Strategy.*

- A. Kolesnikov, the inventor of METUWAK, is currently preparing prototypes of the system The goal of this project is a large-scale electricity production using renewable energy (‘man-made’ constant airflow created by cars on autobahns - wind) that would not require deforestation, exploitation of the agricultural land masses , for a comparable to the similar devices kWh cost, but without effecting the nature and climate.

- AWINGEN is set to allow for production of a big amount of ‘green’ electricity using only already utilized industrial territories with a GHG emission rate approaching zero. It can also provide lightning for the autobahns increasing safety of the roads.

- We are planning to attract additional funding during the stage of R&D from the state banks of the constituent states of Germany (Spain, Italy, France etc.), as well as from KfW, KfW IPEX, IBB, HELABA, EIC Patfinder, EIC Accelerator for the project scaling , and IPO in 3 to 4 years. Additionally, we are planning for the ‘green’ bonds issuing based on the concept of green financing (Green Financing Framework GFF).

- AWINGEN will lead to the rapid increase in the renewable - ‘green’ electricity production (using the ‘man-made’ wind) which could substitute coal and nuclear electricity production.

## 1.2 Presentation of the applicant

**Presentation of the applicant**

*Brief presentation of the applicant(s) (including any affiliated entities and other participants involved in the action) proposing the project: areas of overall and project-specific expertise, number of employees, founding year, geographical locations. Explain why the applicant is suitable for implementing the project.*

AWING GmbH, 60438 ,Germany, Frankfurt-am-Main, 08.10.2020. Anton Kolesnikov, the founder of AWINGEN and inventor of the METUWAK system has an extensive experience in implementation of the scientific and high-tech project (Marussia Motors Company) and can guarantee the participation of a technical university and has a ready-to-work team of managers with extensive and successful work experience in the relevant fields.

## 1.3 Technical characteristics and scope

**Technical characteristics and scope**

*Outline the technical characteristics and scope of the project. Explain why the proposed solution is the most suitable for achieving the project’s objectives.*

*Briefly describe the scope, approach and key technical characteristics of the project, including:*

- *Location of the project*
- *Expected output in terms of volume of main product(s)*
- *Expected source of key inputs and feedstock*
- *Technology, and why this has been chosen over alternatives*
- *Current status of project development*

1.3.0 - 1.3.1 METUWAK – multi electric turbine vertical wind generator. The production process of METUWAK device or METUWAK system is simple and can be established in any EU country. METUWAK is designed using the basic metal-rolling and simple elements of construction and control. Any enterprise, posessing the technology of cutting and welding metal and basic electromontazh can establish a production of METUWAK systems. Therefore, production of METUWAK systems can not only be established in several countries of the EU, but also in several regions (constituent states) of each country using the principal of the licensed production/assembly/installation. Currently the project is located in Germany, Frankfurt-amMain. Business plan is create using the segment of METUWAK system which is 10 km long and has an installed power of 300 MWh. The estimates are as follows: a 10 km long section of METUWAK with the installed power of 300 MWh and 45% efficiency rate can produce 78,300,000 kWh/year. The cost of a serial section of METUWAK which is 10 km long is 22,5 million euro. The investment cost per 1 kWh is 750 euro (with an average for similar devices on the market currently resting between 770 and 1030 euro per 1 kWh). 10 km of METUWAK systems in the run of 20 years can generate a profit of 46,078,648 euro with the cost of 0,04 euro per kWh.1000 km of METUWAK can generate of 7,830,000,000 kWh/year with an investment value being 22,475,000,000 euro.

1.3.2 Theres about 60,000 km of autobahns in the EU. Using only 17% of that, which is 10 000 km, we could generate 78,300,000,000 kWh/h per year for 224,750,000,000 euro of investement value. In 20 years 10 000 km of METUWAK can with the 31% tax, 1,5% funding interest per year, bring 46 billion euro of profits.

1.3.3 Core resources – financing (aimed primarily at the research and prototyping). Around 10 million euro is required for R&D and another 25 million euro for the pre-production segment of METUWAK which is 10 km long (further in the text referred to as METUWAK.10.01), funded by the subsidies and grants of German and EU state banks. Furthermore, both the creation of the METUWAK.10.01 and carrying out of R&D require the construction of the experimental plant, that would be producing the systems of the pre-production segment themselves, as well as developing the technology of production line and design the licensed plants in terms of the equipment required for production/assembly and creating the technological chains. Along with the experimental plant and the lab, headquarters of the project will be established, that would include the project office, business supply services, Center of Competence and Staff training (production, maintenance, service, reparation works, installation, rotation etc.). Expenses for the experimental plant and lab, the headquarters and the Center of Competence are estimated at 25 million euro. Organization and commercial (serial) production: loans and credit, equity (IPO or the private sales). Materials and supplies during the early stages are to be purchased from the open market, later during commercial (serial) production – from the subcontractors.

1.3.4 The technology of METUWAK was selected due to its undeniable advantages:

1) METUWAK is a safe device. It is made of 500-700 kg of welded steel (per every 6 m), therefore even in a case of an accident with a car directly hitting the guardrail, the construction will not be destroyed. Moreover, the entire system is covered with a metal net.  the roads. It allows for licensed production: simple, small-scale and spread around the EU.

2) it doesn’t require the release/exploitation of additional land. The system is installed on the states owned autobahns. Installation, dismantle and and repairs to the systems are simple and require only 2-3 people and a truck crane; the system requires no concrete base;

3) it doesn’t require deforestation; doesn’t interfere with movements of birds since it is shorter than the fences, surrounding the highways (this, in it turn, also prevents the mechanisms from being harmed by the animals, e.g. when the rodents bite of the wires of solar batteries); there’s no associated ocean pollution; there’s also no soil pollution, since METUWAK’s blades are not made of fiberglass and thus do not need to be buried in contrast to the majority of the devices currently in exploitation – METUWAK is 100% recyclable;

4) the system can be installed at the areas with the energy deficit – at the required location, thus there is no need to stretch the power lines there. 5-10 km of the system can provide for the electric car filling stations (or provide for hydrogen production for the hydrogen vehicles at those stations);

5) the wind as the source of energy for this generator does not depend on weather conditions; it is being generated by the traffic for at least 16 hours a day during the most active vehicle movement;

1.3.5 There are developed technical drawings; the project company is registered; an application for a European patent is issued; trademarks are registered. Business plan, feasibility study and SWOT analysis are completed. Mechanical parts of the prototypes 1-5 are produced and being tested. The control system and trial operation roadmaps are in development. Pre-negotiations with a technical

### 1.4 Requested EU contribution (EUR)

**Requested EU contribution**

*Indicate the requested EU contribution for the project (EUR) based on an approximate estimate of the relevant costs.*

*Only an indicative estimate of EU contribution is required. However please note that the amount of the requested EU contribution at the second stage may differ from the indicated EU contribution at first stage due to the project development by a maximum of 50% and such a change must be duly justified.*

*For guidance regarding calculation of relevant cost refer to the Annex B of the call for proposals. The maximum amount of the requested EU contribution cannot exceed 60% of the relevant costs.*

*The indicative EU contribution and project budget must be consistent with the calculations in the financial maturity section and the submitted business plan.*

For the R&D and production and testing of prototypes stage 10 million euro of subsidies and grants euro is required in the following proportion: 6 million from the EU and 4 million from Germany.

For production of METUWAK.10.01 25 million euro of subsidies and grants is required in the following proportion: 15 million euro from the EU and 10 million euro from Germany.

To create of the experimental plant, that would be producing the systems of the pre-production segment themselves, as well as developing the technology of production line and design the licensed plants in terms of the equipment required for production/assembly and creating the technological chains; the lab; headquarters of the project (including project office, business supply services, Center of Competence and Staff training) 25 million euro of grants and subsidies is required in the following proportion: 15 million from the EU and 10 million from Germany.

All these one-time expenses can then allow for the scaling of the project and its licensed production and implementation in ANY European country without any additional costs for testing/experimental labs/headquarters/pilot segments etc., creating (directly or indirectly) job opportunities and attracting local productions through the public-private partnership.

## 2. GHG emission avoidance potential (award criteria)

### 2.1 Absolute GHG emission avoidance

*Absolute GHG emission avoidance*

*Calculate the potential for absolute GHG emission avoidance during 10 years after entry into operation in accordance with the GHG emission avoidance methodology described in Annex C of the call text.*

*Support the calculation with:*

- *Copy of own detailed calculation as one editable Excel document (mandatory). Templates that will ease the calculation and its presentation are provided for the sectors of CCS, renewable electricity and heating, and energy storage. Due to the variety of possible cases in the sectors of energy intensive industries, it hasn't been possible to develop a template to guide the calculations. Applicants are however encouraged to structure the presentation of the calculations in a similar way to the extent possible, i.e. using the same tabs in one Excel document: overview, summary, reference emissions, project emissions, conversion factors.*
- *Detailed explanation of the assumptions made and consistency with the methodology*

The aim and the objective of this project are to create GHG emission-free wind-electricity-generating system. The only emissions produced come from the usage of steel elements (75 tonnes per 1 km of METUWAK), however those are accounted for by the steel industry, which in its turn is trying to employ new technology of using hydrogen. The process of installation does not require any use of cement and the like for METUWAK does not require the foundation. There are emissions from welding and cutting metal elements, but these are minor and only occur in the process of installation and de-montage, not during exploitation. Moreover, all of the elements are 100% recyclable since the blades are made of plastic or aluminium, not fiberglass. METUWAK does not require deforestation for it's installation and allows for creation of tank station for electro-cars without bringing in the electric main, which also saves resources and potentially - forests, and thus reduced the environmental harm. Therefore, the GHG rate of METUWAK is believed to lay around 8g of CO2 per kWh and lower, whereas the general estimate for wind turbines lays between 8g and 37 g per kWh.

## 2.2 Relative GHG emission avoidance

**Relative GHG emission avoidance**

*Calculate the relative GHG emission avoidance during 10 years after entry into operation following the GHG emission avoidance methodology described in Annex C of the call text.*

*Support the calculation with:*

- *Copy of own detailed calculation as an editable Excel sheet (mandatory). Both absolute and relative emission avoidance calculations should be presented in one Excel document, see note above on the available templates.*
- *Detailed explanation of the assumptions made and consistency with the methodology.*

Currently, it is believed that the rates of GHG emissions from wind produced electricity can potentially only constitute to 0.99% of emissions by gas and 0.56% of emissions of coal power. METUWAK system strives to and allows for even greater widening of this gap, minimizing emissions, as stated above, through employment of different production materials, better geographical location and prevention of greater environmental harm.

## 2.3. Comparison of the emissions from processes with the EU ETS benchmark(s) (only for projects producing products with a EU ETS benchmark)

**Comparison with EU ETS benchmark emissions**

*Calculate the GHG emissions per unit of product according to the EU ETS methodology and compare with the equivalent EU ETS benchmark(s) applicable at the time of the application*

This technology is innovational thus it cannot be compared to equivalent benchmarks.

## 2.4 Sustainability of biomass (only for projects using biomass as feedstock)

**Sustainability of biomass**

*Projects using biomass as feedstock should confirm that the used biomass will at least meet the sustainability requirements of the Renewable Energy Directive and originate from feedstocks with a low risk of causing indirect land-use change. Explain how the sustainability will be ensured.*

METUWAK project does not employ biomass and thus is 100% sustainable as it does not employ limited resources, is independent from weather conditions and does not harm the environment.

## 3. Degree of innovation (award criteria)

**Degree of innovation**

*Describe whether the proposed action (technology / product) is innovative in relation to the state-of-the-art and how it goes beyond incremental innovation.*

*Include in the description clear arguments on how the technology / product is innovative in relation to state-of-the-art in terms of performance, reliability & availability, maintenance, economics, simplicity of design, simplicity of manufacturing, simplicity in control & operation. Explain these for all parts or aspects of the project that you consider innovative.*

For reliability and sustainability please see 1.3.4 (from production point of view, not investment appeal)

High reliability of the project is ensured by utilization of the standardized elements in mechanical and control systems. Availability and simplicity of production of the METUWAK system allows for it to be produced by the small and medium-sized enterprises without any particular limitations (see 1.3.1 and 1.3.4). Simplicity of maintenance, control and operation is achieved through simplicity of installation and dismantle and repairing in the comfortable factory conditions (a damaged part of the system is removed (METUWAK.006.0) and substituted by the functioning cassette and then repaired directly at the plant).

## 4. Project maturity (award criteria)

### 4.1 Technical Maturity

**Technical Maturity (short summary)**

*Provide a description of the technical maturity of the project, focusing on the evidence on the degree of technology readiness and technical feasibility of the project within its operational environment. Reflect the current state of project development, building on any available information or documents.*

*Attach documents:*

- *Feasibility study (mandatory)*
- *Any existing technical due diligence report produced by an independent party (optional)*

*Provide the details in the boxes below and provide precise references to the relevant sections of the supporting documents.*

1. Technical drawings of the system are completed. Mechanical parts are produced for the following types of prototypes: 1) with the belt drive; 2) with the cranking mechanism; 3) with the wind directing system; 4) without the wind directing system; 5) an anemometer bar

2. The anemometer bar, which is currently in production, is designed to measure determine the most favorable hight of the turbines depending on the speed of the wind.

3. The mechanical parts of the prototypes are currently being tested in the lab.

4. The METUWAK control system is currently in development.

5. The project's technological feasibility is ensured by the simplicity of production, control, installation, dismantle and maintenance of METUWAK. Any enterprise, possessing technology of cutting and welding metal and basic electromontazh is fitted for establishing the licensed METUWAK production. can establish a production of METUWAK systems. The system's components will be purchased from the subcontractors with retention and connection components. The localization of the licensed production will be implemented on the partner enterprises' (subcontractors') territory, therefore the project does not involve creation of facilities for its own production, with an exception of the experimental plant.

**Technology readiness**

*Describe the degree of technology readiness of your project and of the various components of your project (TRL) before the project and after the project.*

The current state of the system - TRL - 3.

The mechanical part of METUWAK system (without control system) is currently being tested in the lab through the simulation of air flow (natural operation conditions).

The control system of METUWAK is in development.

The financial model, business plan, feasibility study, SWOT analysis are completed.

Project management team is formed and on a stand by.

**Technical feasibility of achieving the GHG emission avoidance within the project's operational environment**

*Describe the technical readiness of the project site, expected project output and technical feasibility of achieving this output.*

*Describe if and how the proposed technology has already been proven to perform in a pilot scale demonstration (where available), including at other sites or with other technical circumstances.*

*Describe how changes in scale or change in circumstances compared to previous testing/projects have been taken into account in the design of the project, where applicable.*

METUWAK system was invented in order to minimize GHG emissions in the process of electricity production.

Expected project output - production of 7,830,000,000 kWh/h per year from a 1000 km segment of METUWAK.

10 km of METUWAK - 78,300,000 kWh/h per year + 45 million euro of profits in 20 years.

An average investment cost of 1 kWh generated by the solar- and wind-power stations of the equivalent installed power - 820 euro. Investement cost of 1 kWh generated by METUWAK - 750 euro!

**Degree of understanding of technology and related technical risks and proposed risk mitigation measures**

*Describe key risks identified in relation to the technology and proposed risk mitigation measures.*

Most important technological risks - friction and aging of metal. Bearings and gearing systems have a limited lifetime and wear out. Ayn electronic devices can malfunction.

We are currently exploring the possibility of using the MAGLEV (magnet levitation) - bearings and generators, and selecting reliable electronic elements of the system.

Worth noting: METUWAK is a safe device. It is made of 500-700 kg of welded steel (per every 6 m), therefore even in a case of an accident with a car directly hitting the guardrail, the construction will not be destroyed. Moreover, the entire system is covered with a metal net.

*Implementation of this project might require a state authorization or a change in national/federal legislation/introduction of a new law or by-law, allowing the installation of METUWAK system on the highways in each EU country of operation. (administrative command risk)

## 4.2 Financial maturity

**Financial maturity (short summary)**

*Summarise the financial maturity of your project. Provide justification for the planned date of financial close and explain how the project will be financially prepared to enter into operation as expected. Reflect the current state of project development.*

*The summary should reflect how financially viable your project is i.e. fundable/bankable, based on project business plan, financial model, financial standing of applicant and of main commercial partners, commitment of other investors or public support. You should demonstrate that the financial risks of the project are understood and there is a sound strategy to mitigate them. Based on this you should explain how the planned date for financial close and entry into operation was determined.*

*Attach documents:*

1. *Business plan (mandatory). The business plan should cover the entire duration of the project.*
2. *Any existing financial due diligence report produced by an independent party, e.g. independent financial assessment (optional).*

*Provide the details in the boxes below and provide precise references to the text in the supporting documents.*

AWINGEN GmbH has a business plan, loan financing repayment plan, estimated positive cash flow and a 45 million euro profit over 20 years from a METUWAK system of 10 km. The project has entered a pre-negotiation stage with the banks. Estimated financial close date - 01.07.2021. By this date all the documents for the provided subsidies for R&D (10 million euro) and METUWAK.10.01 production (30 million euro) will be signed.

We are planning to raise funds during the early stages of the project from: EIC Patfinder and EIC Accelerator (for project scaling), KfW, KfW IPEX, IBB, HELABA and other state banks, ministries of science, ministry of industry and other state/federal agencies. After successful implementation and trial exploitation of METUWAK.10.01, we are planning to do the IPO to attract commercial investment into AWINGEN project. We are also planning to issue ‘green’ AWINGEN bonds, issued based on the concept of green financing (Green Financing Framework GFF).

Based on the fact that it is the state (Germany) in the face distribution companies obtaining the electricity generated by METUWAK according to the legally established price of 0,04 euro per 1 kWh, several market mechanisms can be employed: public-private partnership, leas, factoring, export finance against the export profits etc.

Attraction of the credit financing for production of serial (commercial) segments is scheduled after the successful trial exploitation (6-8 months) from 01.07.2022.

Production of serial systems is presumably financed through the long-term loans from the state banks and later from the banks and private investors, since METUWAK system is not only financially self-sustainable, but also generates a stable profit.

Commercial (serial) systems can be implemented, installaed and maintained by the constituent states autobahn control centers baed on the public-private partnership, since the and exploited for the autobahns is state owned.

We are planning to deploy serial production of METUWAK systems at several enterprises - subcontractors in various states in Germany simultaneously in order to avoid large delivery legs.

On the early stages of the project we are planning to implement METUWAK systems in agreement with the general plan of the autobahn reconstruction (Verkehrsplan 2030).

**Credibility of the business model**

*Describe the proposed project business model, targeted market(s), including the project's value proposition, and how it addresses market gaps.*

*Provide description of project costs, revenues and profitability. This should include the best estimates currently possible of:*

- *The project capital expenditures (CAPEX), operations and maintenance costs (OPEX) and the expected revenues. Describe the main cost items*
- *Describe cash flow projections along the project milestones*
- *Internal Rate of Return (IRR) before the requested Innovation Fund support*
- *Internal Rate of Return (IRR) after the requested Innovation Fund support*

*Include the description of prices assumed and expected revenue structure. Costs and revenues should be presented in constant prices.*

AWINGEN headquarters will include the project office, Center of Competence and Staff Training, business supply enter and the experimental plant and lab, that will be designing and producing the prototypes, testing them, creating the modal draft of the licensed assembly and production; it will be producing systems of the pre-production segment; developing the technology of production line and design the licensed plants in terms of the equipment required for production/assembly and creating the technological chains. Once the trial stage is cleared, it will be producing serial METUWAK systems. Project office is responsible for: project documentation development, including legal, financial, technological and licensing documentation; placing orders for all the needed additional tests, expertise; contract database; project excecution/performance monitoring; conducting negotiations with the external partners including the state/federal banks and EU/interested EU countries agencies; prepares the issuance of the 'green' bonds' prepares for IPO. The total staff number of all the facilities - under 50 people.

Targeted markets of AWINGEN are wholesale electricity markets of Germany and her EU countries (Spain, France and Italy having priority, each having 6000 km of autobahns).

Project value proposition: a unique trade advantage of AWINGEN project (which can be implemented in any end every EU country) lays in producing 783,000,000 kWh/h per year (from a 100 km segment) of 'green' electricity (with a potential to utilize solar energy and produce 'green' hydrogen), cheaper than any other wind- and solar-power plants with comparable installed power (750 euro per kWh), WITHOUT using new on- and off-shore territories, deforestation, and climate deterioration. It can also provide lightning for the autobahns increasing safety of the roads.

WINGEN produces 78,300,000 kWh/h per year from 10 km segment at the locations with electric energy deficit. AWINGEN's METUWAK technology allows for creating electric and hydrogen refilling stations at any spot on the autobahn without connecting it to the power lines, providing the possibility to produce hydrogen on the spot.

CAPEX: 1) creating of the headquarters (with the project office, business supply center, Competence andStaff Training center) and an experimental plan with the lab and equipment - 25 million euro; 2) R&D expenses - 10 million euro; 3) production of METUWAK.10.01 - 25 million euro.

OPEX per a 10 km segment with the cost of 22,5 million euro is 300,000 euro per year (salaries, maintenance, replacements, license fees, installation, repairing works)

Revenues from a 10 km segment per year - 3,132,000 euro (78,300,000 kWh x 0,04 euro Germany is currently buying 1 kWh for by the «Erneuerbare Energien» law of 1.04.2000).

Profit (after paying off the credit, depreciation and taxes) from the exploitation of a 10 km segment per year - 274,000 euro; from a 100 km segment - 2,740,000 euro; from a 1000 km segment - 27,400,000 euro; from a 10 000 km segment - 274,000,000.

Estimated time of exploitation - 20 years.

Cash flow.

1st year: 10 million euro - R&D, 25 million euro - creating the headquarters with the center of competence and an experimental plant. 2nd year: 25 million euro - METUWAK.10.01; 45 million euro - placing the order for the serial segments for 200 km (a 10% advance). 3d year: 405 million euro - rest of payments for a 200 km segment (90%); 67,5 million euro - a 10 % advance for the next 300 km segment. 4th year: 607,5 million euro - rest of payments for a 300 km segment (90%); 112,5 million euro - a 10% advance for the next 500 km segment. 5th year: 1,012,500,000 euro - rest of payments for a 500 km segment (90%). Outcome: 1000 (+10) km of the operating systems.

IRR 20%

IRR with the EU grant - over 20%

**Soundness of financing plan and solidity of commitment of project funders and investors**

*Describe the proposed project financing plan, including envisaged financial structure of the project (level and source of equity, level and source of debt, expected public subsidies and their source).*

*Describe the state-of-play, nature, level and conditions of support provided from project funders and investors, including the own contribution by the applicant. Provide corresponding evidence (e.g. letters of interest, letters of support, letters of approval from funders, letters from shareholders or board confirming the submission and the support of the financing plan).*

*Provide evidence on support from other sources including market mechanisms, or support from Member States and status/planning for State aid clearance where relevant.*

Financing plan: 1 year - 35 million euro; 2 year - 70 million euro; 3 year - 492,5 million euro; 4 year - 720 million euro; 5 year - 1,012,500,00 euro

60 million euro for R&D, the experimental plant and lab, headquarters and METUWAK.10.01 should consist of the subsidies and grants (36 million from the EU and 24 million from Germany, where the financing sources are KfW, KfW IPEX, IBB, HELABA, the state banks of Bayern and Baden-Würtemberg, KfW Capital, the framework program Horizon Europe, EIC Patfinder, EIC Accelerator. Other sources of funds - long term credits in the European state banks of Italy, France, Spain, etc. Other potential sources of investment funds are the IPO funds and 'green' AWINGEN bonds, issued based on the concept of green financing (Green Financing Framework GFF).

The own contribution by the applicant consists of the registered project company AWINGEN GmbH, paid application for the EU patent, paid production of the prototypes 1-5, paid business plan and feasibility study, created and paid project website awingen.com. The applicant will produce working prototypes with and conduct the lab tests with their own funds.

**Level of understanding of the expected financial risks of the project and quality of proposed mitigation measures**

*Describe the expected financial risks of the project (e.g. cash flow volatility, credit/counterparty risks, risk that public subsidies are discontinued or reduced) and how you propose to mitigate these risks.*

One of the greater risks is a potential decrease in the costs of procurement from the German government's side (the cost is currently being held at 0,04 Euro per kWh based).

The counterparties/subcontractors risks are relatively low due to the fact that there will be a great number of the, producing significant amounts of identical METUWAK systems in various constituent states and countries of the EU.

There is also a risk of phasing out/ removal of public subsidies. However, after the installment of METUWAK.10.01 into trial operation there will be an immediate possibility to substitute public subsidies with commercial credit and investments, for AWINGEN is set to generate large revenue and income and has an astonishing export potential.

Other risk lays in the factors we cannot possibly account for such as COVID-19, where there is no developed and standardized counter-measure plan.

Major administrative risk - implementation of this project might require an official state permission or a change in national/federal legislation/introduction of a new law or by-law, allowing the installation of METUWAK system on the highways in each EU country of operation.

## 4.3 Operational maturity

**Operational maturity (short summary)**

*The summary should demonstrate that the project implementation plan is sufficiently developed, comprehensive and realistic.*

*Clearly indicate the current standing in the project development cycle.*

*Describe the prospects for successful construction, commissioning and entry into operation of the project.*

*Reflect the current state of project development, building on any available information or documents.*

*Attach documents:*

- *Project implementation plan (mandatory).*

*Provide the details in the box below along with precise references to the relevant section of the project implementation plan.*

Presently, the following procedures have been carried out: the project company is registered; an application for a European patent is issued; trademarks «AWINGEN» and «METUWAK» are registered. Business plan, feasibility study and SWOT analysis are completed.

The mechanical parts of the prototypes 1-5 are produced and are currently being tested. The control system for METUWAK is being developed.

**Credibility and level of detail of the project implementation plan covering all project milestones and deliverables**

*Describe the project timeline and key milestones and deliverables for project development, construction and roll out, including the project monitoring reports after entry into operation (note: these reports must include annual GHG emissions avoidance reports).*

*The timeline provided must cover the period of the project implementation starting from the signature of the grant up to the end of the proposed monitoring and reporting period.*

Please see implementation plan. Each year of exploitation of the system the following reports will be created: GHG emissions avoidance; performance monitoring; financial; technical.

**Relevance and track record of the project management team and soundness of the project organisation**

*Describe the project management team, its professional capacity, relevant track record, and proposed project organisation including decision-making structures and processes.*

Anton Kolesnikov (occasionally spelled as Kolesnikow on the internet) has an extensive experience in implementation of the scientific and high-tech project (a co-founder, co-owner and CEO of Marussia Motors Company) in cooperation with the leading technological universities and companies. He was also a co-owner of Marussia F1 (Marussia Virgin, a F1 team). Before he's endeavors in the automobile industry he organized the purchase and implementation of the first HD mobile television station. He is experienced in leading a successful business in Europe, being and owner and CEO of K&V Immobile Project GmbH (Germany).

The managing team under Kolesnikov's lead has a extensive and successful relevant experience and is ready to start work in the AWINGEN project's managing team as soon as the funding is approved. Our relevant knowledge includes but is not limited to the Quality Management System (Quality Gates), KANBAN System, Just in Time system, STS (System Technical Specification). We use the following operations environments: SAP, ANSYS, CFD, Project management.

**State of play and credibility of the proposed plan for obtaining required permits, intellectual property rights or licences and other regulatory procedures.**

*Describe the required permitting and other relevant regulatory procedures, steps towards acquiring intellectual property rights or licences including the list of permits/rights/licences already obtained, those still needed and the envisaged timing for obtaining them.*

*Describe the regulatory framework/support relevant for the project.*

The project company is registered. The transfer of rights for the trademarks and the EU patent appreciated is being legalized. Our next step is obtaining the business-number and VAT number.

**Strategy for ensuring public acceptance of the project**

*Describe environmental impacts during construction and operation and the state of public acceptance of the technology and the project.*

*Explain how you propose to ensure the public acceptance of your project.*

Our strategy is the public-private partnership. AWINGEN's objective is 100% in line with the EU's strategy of environment protection and offers means to put EU's ecological conception into effect. Thus this project is extremely likely to win public approval and, furthermore, support.

**Robustness and credibility of the strategy for securing the key supply and off-take contracts**

*Describe the main commercial contracts envisaged and a graphic showing the contractual relationship between the main parties involved with the project. List and describe any preliminary agreements with suppliers or off-takers, where available, and strategy for timely conclusion of further required agreements. Include short description of key contracts and explain how the required solidity/track record of suppliers and off-takers will be ensured.*

METUWAK systems consist of simple materials: a steel square profiled metal tube, produced in any country of the EU and simple electronics components, that are widely available on the market. Thus, there is no risk of the deficit of materials or devices, which in in turn means it is not necessary to have / select suppliers ad subcontractors upfront.

**Level of understanding of the project's implementation risks and credibility of proposed mitigation measures**

*Describe the expected project implementation risks and propose strategy to mitigate them.*

Major administrative risk - implementation of this project might require a state authorization or a change in national/federal legislation/introduction of a new law or by-law, allowing the installation of METUWAK system on the highways in each EU country of operation.

The installation of METUWAK systems will require interference with traffic on the key thoroughfares. Consequently, the rudimentary stages of installation will be carried out in accordance with the German Federal Plan of Reparation and Modernization of Highways (Bundesverkehrsgesetz 2030).

## 5. OVERVIEW OF SUPPORTING DOCUMENTS TO BE SUBMITTED

| Mandatory documents | Page limit | Optional documents | Page limit |
|---|---|---|---|

| | | | |
|---|---|---|---|
| • Detailed calculation of GHG emission avoidance potential (in editable xls format)<br>• Feasibility study (in pdf format)<br>• Business plan (in pdf format)<br>• Project implementation plan (in pdf format) | n/a<br>80<br>25<br>25 | Any existing due diligence reports (pdf format) | n/a |

*Note that excess pages will be blanked for evaluators and therefore disregarded.*

*The mandatory documents can include any existing documents by the applicant or third party that the applicant considers useful and that fall in the scope of the documents listed in the table above.*

## 6. DECLARATIONS

| **Personal data protection** | |
|---|---|
| The applicant confirms that all individuals whose personal data is submitted by the applicant agree that such personal data may be used for the purposes of evaluating the application and subsequent management of the grant and, if needed, programme monitoring, evaluation and communication. | **YES** |
| If NO, add explanation | |

| **Information sharing with the European Investment Bank (EIB)**<br>*Rejected projects at first stage and identified by evaluators for the PDA support will be further assessed by the Commission and the EIB, to draw the short-list of projects awarded the PDA support.*<br>*Information sharing with EIB requires explicit acceptance by the applicant.* | |
|---|---|
| We confirm our acceptance to our application and all related documents being passed to the EIB if it is identified by evaluators as having potential for improving its maturity through specific PDA support. | **YES** |
| If NO, add explanation | |

| **Publication of general summary and anonymised project information**<br>*General information on the background and rationale of the project, its objectives, impacts and contribution to EU policy objectives as outlined in the project summary and in section 1.1. can be communicated by the Commission in summary and anonymised way before the signature of the grant agreement.*<br>*Publication of this information requires the explicit agreement of the applicant.* | |
|---|---|
| The applicant confirms their agreement with the publication in a summary and anonymised way of general information on the background, rationale, objectives, impacts and contribution of the project to EU policy objectives. | **YES** |
| If NO, add explanation | |

| HISTORY OF CHANGES | | |
|---|---|---|
| VERSION | PUBLICATION DATE | CHANGE |
| 1.0 | 03.07.2020 | Initial version. |
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