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To Ibis Power
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Subject
Validation PowerNest demonstrator

Date
26 January 2017

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Our reference
EES/AJMP/17.003

Dear Diana, dear Alexander,

With reference to our discussion on January 13, 2017, I hereby like to report on my opinions on the validation of the PowerNest demonstrator unit.

Harvesting wind energy in the build environment is very difficult and challenging, due to the low energy density of the wind energy and due to the strong effect of buildings on local wind velocities and turbulences. The PowerNest technology aims at guiding the air flow to a micro windturbine via a rooftop structure that, by a venturi effect, enhances local air velocities at the position of the turbine, thus enhancing the possible energy yield of the turbine and making the system less sensitive for disturbing turbulences. I believe this is a great and feasible idea to improve the efficiency and yields of urban wind turbines.

In addition, the PowerNest solution not only yields urban wind energy, but is a hybrid system that yields a significant amount of solar power via pv modules that are nicely integrated in the PowerNest module. This increases the economic viability of the technology and aggregates the total amount of renewable energy that is generated by a module. To my opinion, also storage technologies (batteries) can be integrated into the PowerNest modules, creating wider possibilities for power matching.

The PowerNest solution is based on a sound concept. The underlying theory and design tools on wind/air dynamics (including CFD modelling), system design and system integration are well developed within Ibis. The design of the demonstrator unit covers all necessary issues (wind velocities, power yield, audible noise, effect on wildlife...), and is well done, reliable and robust.

The proper design is confirmed by the validation experiments with the demonstrator unit in Eemshaven. The experimental results are in good agreement with theoretical and design parameters. The demonstrator is performing reliably and according to the design.

In conclusion, the PowerNest concept is a great concept to harvest urban wind in combination with solar energy. The technical feasibility is sound and based on high quality modelling and design tools developed and available within Ibis. These tools have been adequately validated by the demonstration tests on the Eemshaven unit.

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As a next step, the PowerNest concept is now ready for a demonstration project on a real building. Ibis is capable of making a proper detailed design for such a unit and for the integration of such a unit with a (existing) building.

I sincerely hope that you can find partners that are willing to realize such a demonstration project with you. The proof of a great idea is in the eating of the pudding, and it's about time to taste PowerNest.

Best regards,



Guus Pemen
Chair Electrical Energy Systems
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