

Assignment student EnTranCe Energy Transition Community

Project title: Auxillary power Units & Ground power Units op Natural Gas.
Suitable for students of: <i>Multiple choices are possible</i>
<input type="radio"/> MBO <input type="radio"/> BuitenWerkPlaats Built Environment (2 nd yr, 1 block, 2 nd yr, 4 block) <input type="radio"/> Vastgoedlab V&M (3 rd yr) <input checked="" type="radio"/> Bachelor graduation assignment (4 th yr) <input type="radio"/> Bachelor internship (limited possibility in daily guidance) <input checked="" type="radio"/> Research assignment in curriculum year 2018 <input checked="" type="radio"/> Honours research assignment <input checked="" type="radio"/> Master thesis
Study Program: Mechanical Engineering Bachelor/Master
Period: Semester 2, Februari-Juli 2018
Language: NL, Eng
Client: Clean Tech Aviation BV; Ben Cappelle; www.ctdc.eu
Internal client: Ramon Alberts, Entrance

Background (facts, situation sketch and parent/organization goals)

CTA builds a test and certification company with a test lab on EnTranCe, aircraft maintenance Assembly and flight testing on Teuge and the innovations in the daughter CTA GMBH Braunschweig airport. CTA builds her organization with a Natural Gas consortium that with partnership with Gasunie, Gasterra, Ebrahimi, the GA-BA engines Lycoming Engines Division and aircraft factories factory Piper, Cessna and Beechcraft, Textron Aviation with the educational institutions Tue and Hanz University applied sciences and the NLR both CTA and the MRO maintenance enables existing stations aircraft engines in the GA and BA Market retrofit to Natural Gas CNG and LNG/vliegtuigen engines that can fly. With this innovation we can a 35% cost reduction for the users and 25% CO2 reduction.

Problem (description of the undesirable situation)

The existing transport aviation as a result of the high cost and complexity and safety regulations are not yet adequate and affordable solution for safe storage and use of green fuel with the existing plane fuel tanks. The sharpened H2020 objectives and emission emissions energy agreement is the following fines and the SER that calls for innovations and technical capacity, green innovations as interim solution where safety is not in question but still experience gained can be on use of fuels that emit less CO2. Each airliner that country and Park at an airport for use by Board voltage of an on board working APU which fueled from the main fuel for propulsion Jet



engines. If we would be the APU (small turbine engine in the tail of the plane and consumes 150 liters of Kerosene per hour in diameter) on a separate LNG liquid tank could connect and on this fuel could make it work, we can the CO₂ emissions during the turn-around phase of each airliner with at least 25% to 88% able to reduce up to

Airport owners are constantly looking for practical solutions which the carbon dioxide helps reduce foot print of the airport. The technical operational services of the airport also uses Ground Power Units for aircraft engines, to help start up and also on work or on diesel or kerosene.

Objective (description of the desired situation)

Conducting research to arrive at results below

Result deliverable/product (what is ready if the project is finished) with list of part results

- GPU and APU manufacturers and the existing types of engines on fitness for identify application, technical data collection, analysis and operational and commercial select target audience.
- Patent research on existing innovative developments within Europe and the USA/Canada about Natural Gas use on GPU and APU 's in aviation.
- Inventory readiness of aircraft manufacturers and aviation authorities (EASA and FAA) to cooperate for such innovation and under what conditions they will be prepared to do this operationally and commercially
- Inventory at airlines on the possibility of acceptance by adapting their fleet if the airplane manufacturer such certified retrofit on existing APU 's and aircraft can deliver.

Competence level

3

Connected to Change Agency ETC

Multiple choices are possible

- Sustainable Building
- Sustainable Mobility
- Local Communities

Further information

Student will be working in the context Energy Transition Community at EnTranCe. You will be working in a multidisciplinary team. For detailed information on this assignment contact Jacqueline Joesse, a.s.j.joesse@pl.hanze.nl (EnTranCe) 050-5954708
A student fee is available.



**Hanzehogeschool
Groningen**

University of Applied Sciences

How to respond to the vacancy

Send a motivation letter and CV to EnTranCe, Energy Transition Community, etc@org.hanze.nl
Attn. Mrs. Jacqueline Jooisse, Office Manager EnTranCe. Note: If the job does not fit directly with
your specific interest, please contact via etc@org.hanze.nl or 050-5954708

Website: <http://en-tran-ce.org/for-students/assignments/assignments-per-study/>