

Humboldt Highway II: computer cluster on renewable energies

Welcome

- Special thanks to [Hamburg Ambassadors](#) for support
- Thanks to DESY for hosting the workshop and supporting the idea: *“The DESY directorate welcomes warmly the participants of the workshop. The transition to renewable energies and its use in research centers is one of the big challenges and is fully in-line with the goals of DESY. The DESY directorates wishes a very successful workshop”*
- This workshop is also part of the [International Year of Basic Sciences for Sustainable Development 2022/2023](#)
 - for information about the IYBSSD look under [Material](#)



How it came about !

- in 2013, scientific exchange between Higher Institute of Technologies and Applied Sciences (InSTEC, University Havana) and DESY started
 - summer-students come every year to DESY, in total now 16.
 - some continue as PhD students (in total 10) some stay in science as postdocs
 - longer stay scientific visits (3 months/year) since 2017
- Idea to establish permanent and regular scientific exchange with institute in Havana
- Good internet connection is needed for scientific exchange – internet connectivity is hampered due to the “US embargo” – Cuba is not connected to fast internet links
- Humboldt Highway projects aims to improving the situation:
 - Application to DAAD (German academic exchange service) for support with devices for video conferencing – in pipeline
 - DESY will support with computing devices

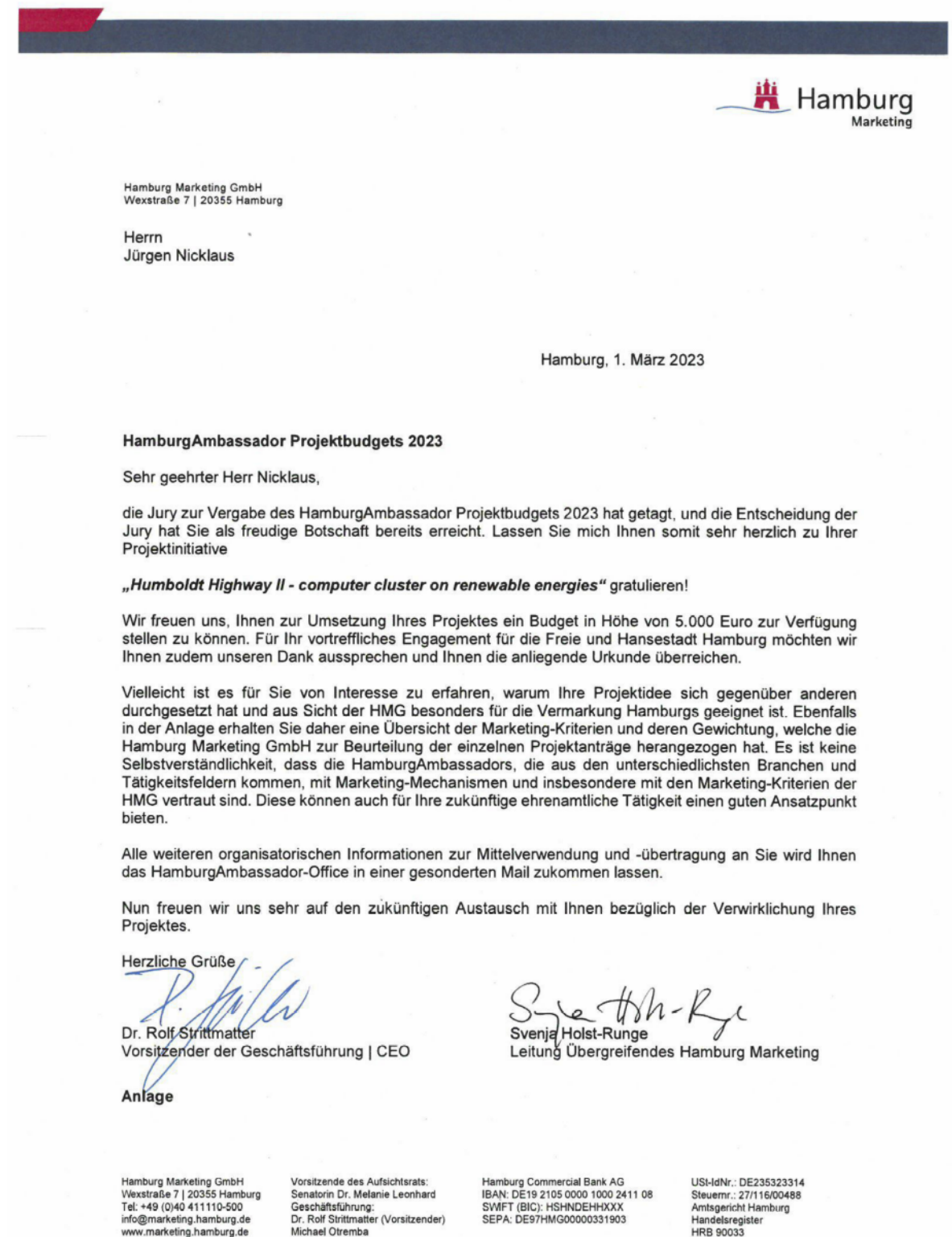
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- In Dec 2022, [J. Nicklaus](#) ([Hamburg Ambassador](#), President & CEO, Stefan Messer GmbH, with special focus on manufacturing and distribution of industrial gases for Cuba and the Caribbean) had the idea to apply for a small project at the Hamburg Ambassador fund – the Humboldt Highway II project

How it came about - HamburgAmbassadors

In Dec 2022, **J. Nicklaus** (**Hamburg Ambassador**, President & CEO, Stefan Messer GmbH, with special focus on manufacturing and distribution of industrial gases for Cuba and the Caribbean) had the idea to apply for a small project at the Hamburg Ambassador fund – the Humboldt Highway II project

- End Feb 2023 application Humboldt Highway II was approved

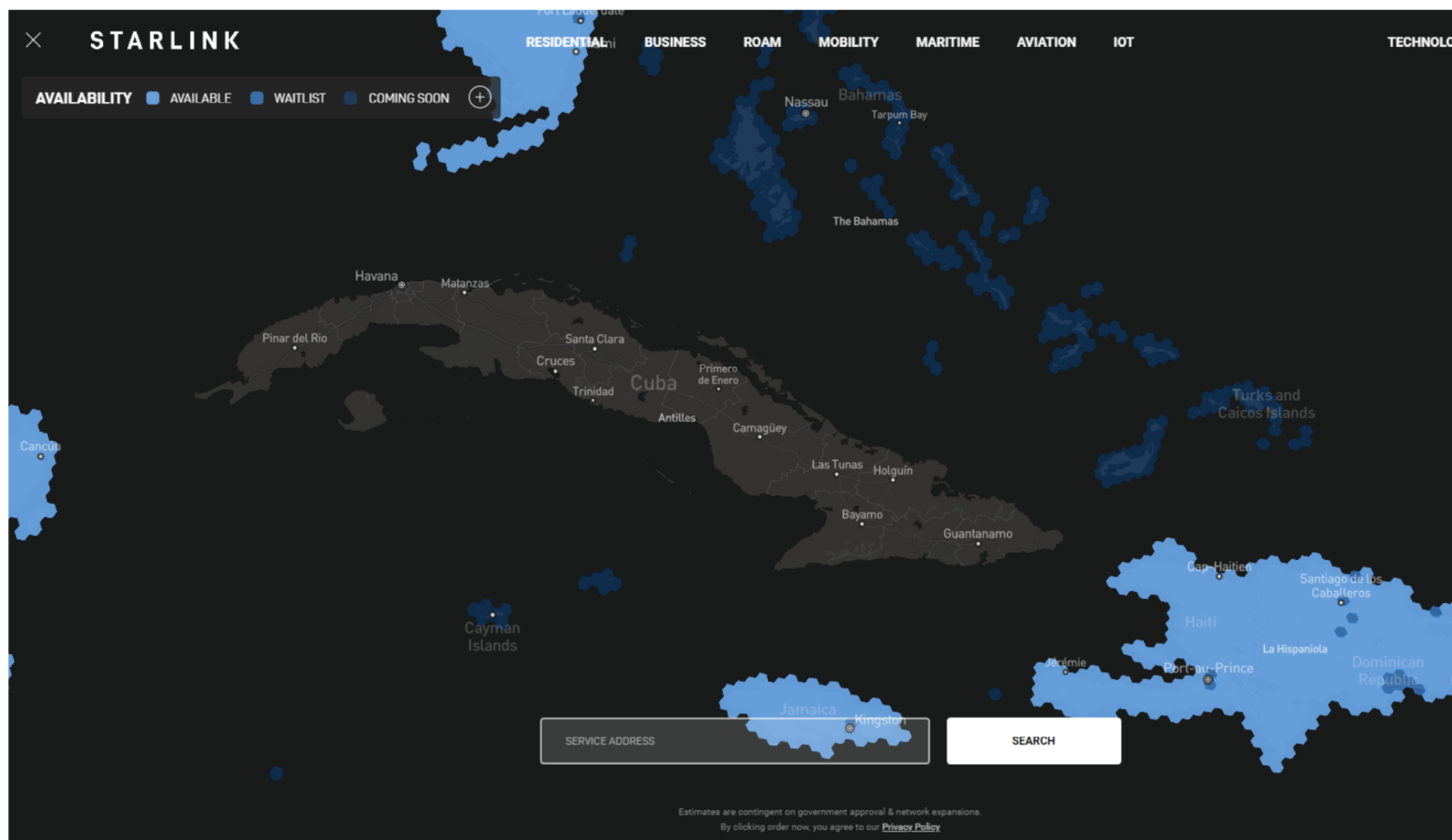


Goals of workshop

- Create a frame for continuous, stable and reliable scientific exchange with scientists in Cuba
- For participation in international collaborations, essential needs are:
 - fast internet connection
 - sufficient computing facilities
- Cooperation with DESY:
 - Humboldt Highway - DAAD (GermanAcademicExchangeService) application for support with videoconference device with support from DESY
 - Scientific exchange in the field of Monte Carlo simulations
- **Humboldt Highway II: computer cluster on renewable energies**
 - build something very challenging and very new and very important

Who was contacted for the Workshop

- For internet connection, [StarLink for Cuba](#) (E. Musk) contacted, but unfortunately there is not even a plan, when it could be accessible in Cuba. The map tells all!



Email exchange with TS2 SPACE on 1 June 2023

Who was contacted for the Workshop

- Science institutes
 - It groups at DESY and CERN (and others)
 - Scientists performing heavy load calculations
- Companies:
 - SolarZentrum Hamburg
 - Gesellschaft für Solarenergie
 - Nordic Solar
 - Electric Energy companies
 - E.On
 - Vattenfall
 - Lichtblick

Who was contacted for the Workshop

- Politics
 - Erster Buergermeister
 - Behörde für Wissenschaft, Forschung, Gleichstellung und Bezirke (BWFGGB)
 - *“Eine Senatsvertretung ist aus unserer Sicht nicht angezeigt.”*
 - Senator K. Fegebank
 - Behörde für Umwelt, Klima, Energie und Agrarwirtschaft
 - Bundesministerium für Wirtschaft und Klimaschutz
 - Workshop: Decentralized energy supply with renewable energies including storage solutions in Cuba 20-23. Nov 2023 Havana (Cuba) ([link](#)) (EnergieWaechter GmbH)
 - ExportInitiative Energie ([link](#))
 - Cuban Embassy in Berlin
- DAAD -Sachmittelabteilung
- Further infos: Germany Cuba – Bilateral relations ([link 15. March 2023](#))

Goals of workshop

- The Humboldt Highway project is also seen as a contribution against the isolation of Cuba as a consequence of the embargo against Cuba.
- The Humboldt Highway project is fully inline with the bilateral relations between [Germany and Cuba](#).
- The Humboldt Highway project aims against a brain-drain from Cuba to Germany, and intends to build and develop scientific structures inside Cuba.
- Since delivery of energy is still much affected by the blockade against Cuba, and power-cuts are happening regularly to ensure energy supply for critical infrastructure, like hospitals etc, a [computer cluster should be operated independent from the public electricity circuits](#). The geographical location of Cuba favors solar-energy and photo-voltaic systems

Goals of workshop

- Discuss possibilities to build a (small) computer cluster which runs fully on renewable energies to support the scientific exchange program between scientists in Cuba and in Hamburg.
- *New philosophy*: instead of requesting energy to fulfill the computing tasks, the availability of energy will dictate the operation of the cluster. While such thoughts will become important for the energy transition discussed also in Europe, it is absolutely vital for a country like Cuba with limited energy resources.
- **Outcome:**
 - Concrete plans for construction and operation of a scalable computer cluster at the InSTEC institute at Havana University for on-site applications of Monte Carlo simulations in the field of elementary particle physics.
 - cluster can serve as a testing field under real conditions for operating a computer cluster based on the availability of energy

Agenda for workshop

WEDNESDAY, 2 AUGUST

09:00

→ 09:20

Welcome and Intro

Speaker: Hannes Jung (DESY)

🕒 20m

📍 Sem 1 (DESY HH)

📄

09:20

→ 09:40

Overview DESY - InSTEC

Speaker: Fernando Guzman Martinez (CMS (CMS Fachgruppe QCD))

🕒 20m

📄

09:40

→ 10:50

Computing Centers in Europe

📍 Sem 1 (DESY HH)

📄

09:40

Computer Cluster at DESY

Speaker: Yves Kemp (IT (IT Systems))

🕒 30m

📄

10:10

Computer Cluster at CERN

Speaker: Tony Cass (CERN IT)

🕒 30m

📄

10:50

→ 11:20

Coffee

🕒 30m

📍 Sem 1 (DESY HH)

11:20

→ 12:20

Computing in Cuba

📍 Sem 1 (DESY HH)

📄

11:20

Computing network at InSTEC (Havana University)

Speaker: Prof. Cesar Garcia Trapaga (University Havana)

🕒 1h

📄

12:30

→ 14:00

Lunch Break

🕒 1h 30m

📍 2nd Aug, Sem1, 3d Aug Sem3

14:00

→ 14:30

Export controls: Export issues

📍 2nd Aug, Sem1, 3d Aug Sem3

📄

14:00

Export Issues – experience from export control

Speaker: Bjoern Felkers (V4 (Warenwirtschaft))

🕒 30m

📄

15:30

→ 16:00

Coffee

🕒 30m

📍 2nd Aug, Sem1, 3d Aug Sem3

16:00

→ 17:40

Computing in Cuba

📍 2nd Aug, Sem1, 3d Aug Sem3

📄

16:00

Computing experience from Cuba

🕒 30m

📄

16:30

Computing in CMS at DESY

Speakers: Danyer Perez Adan (CMS (CMS Fachgruppe TOP)), Luis Ignacio Estevez Banos (CMS (CMS Fachgruppe QCD)), Sandra Consuegra Rodriguez (CMS (CMS Fachgruppe HIGGS))

🕒 30m

📄

19:00

→ 22:00

Conference Dinner at Cafe Buena Vista

🕒 3h

<https://www.facebook.com/profile.php?id=100063675248535>

Agenda for workshop - tomorrow

THURSDAY, 3 AUGUST			
09:00 → 10:30	New approaches and energy resources and possibilities in Cuba	📍 Sem 3 (DESY HH)	✎
09:00	Aspects of energy consumption and reduction for computer clusters	🕒 45m	✎
	Speaker: Rod Walker (LMU)		
09:45	Energy transition policy in Cuba: achievements and challenges	🕒 45m	✎
	Speaker: Prof. Lidice Vaillant (University Havana)		
10:30 → 11:00	Coffee	🕒 30m 📍 Sem 3 (DESY HH)	
11:00 → 12:30	Funding possibilities	📍 Sem 3 (DESY HH)	✎
11:00	Discussion on Funding Options - IDEas	🕒 1h	✎
12:00	Closing	🕒 30m	✎
12:30 → 14:00	Lunch Break	🕒 1h 30m 📍 2nd Aug, Sem1, 3d Aug Sem3	
14:00 → 16:00	DESY tour	🕒 2h 📍 2nd Aug, Sem1, 3d Aug Sem3	✎

Longer term goals

Common projects in the field of high energy physics between InSTEC and DESY:

- Theoretical and phenomenological calculations can be performed at the computer cluster on renewable energies at InSTEC.
- Scientists at DESY offer voluntary partnerships to students and scientists at InSTEC to support experimental analyses with theoretical and phenomenological calculations. The calculations should be directly connected to the experimental analysis.
- For introduction, the student comes for a visit of 3 months to DESY to learn the basic requirements of the experimental analysis
- A senior scientist or postdoc at DESY supervises together with a senior scientist at InSTEC the theory calculations
- The partnership with InSTEC could result in a CMS association with the scientists involved (to be clarified with CMS)

This cooperation with InSTEC would allow to develop a phenomenology group for particle physics at InSTEC and would allow to perform PhD theses in particle physics at Havana University.

Welcome to the workshop:

Humboldt Highway II: a computer cluster on renewable energies for Cuba