

2024.05.18 Литий-металлические батарейки - электроавиация наконец взлетит? [rs](#)

В продолжении вчерашней заметки про потуги с батарейной еврореволюцией. Ядром евро батарейного кластера на данный момент является компания Northvolt (<https://northvolt.com/manufacturing/>).

Так вот в добавок к двум линейкам промышленных аккумуляторов - они наконец, спустя два года после анонса, запускают еще одну линейку "батареек" с улучшенными (масса/выхлоп, количество циклов) характеристиками.

Подробности

<https://northvolt.com/articles/cuberg-may2024/>

Enabling aviation businesses

eVTOL operators need a battery with high discharge rates, low weight, and consistent performance over hundreds of missions. Cuberg battery systems can provide all three.

Specific energy

The Cuberg module has achieved specific energy of 284.8 Wh/kg, an industry-leading accomplishment for electric aviation. This significant improvement in specific energy translates to increased flight range which, in turn, enables new use cases for electric aviation.

High specific energy enables operators to choose between longer cruise times or heavier payloads – both of which massively expand the universe of profitable use cases for an eVTOL. Some operators could see their practical range more than double, depending on their aircraft and powertrain design.

Manageable heat

Airframers designing eVTOL aircraft will also take note of the Cuberg module's very low growth in direct current internal resistance (DCIR). Low resistance growth reduces demand on thermal management system engineering, thereby facilitating lightweight and low-volume battery systems.

Long service time

A module that does all of the above, while retaining 90% state of health at approximately 700 missions, is well-suited to underpin a profitable eVTOL operation.

Energy L

Material	By Volume	
Diesel Fuel	10,700 Wh/L	12,
Heating Oil	10,400 Wh/L	12,
Gasoline	9,700 Wh/L	12,
Butane	7,800 Wh/L	13,
LNG (-160°C)	7,216 Wh/L	12,
Propane	6,600 Wh/L	13,
Ethanol	6,100 Wh/L	7,
Methanol	4,600 Wh/L	6,
NG	3,100 Wh/L	12,
Liquid Hydrogen	2,600 Wh/L	39,
150 Bar Hydrogen	405 Wh/L	39,
NiMH Battery	280 Wh/L	
Li-Ion Battery	200 Wh/L	
Lead-Acid Battery	40 Wh/L	
STP Propane	26 Wh/L	13,
STP NG	11 Wh/L	12,
STP H ₂	9 Wh/L	39,

(что конечно далеко до водорода - поэтому не устану повторять массовая "малая" авиация будет рано или поздно на водороде к

Что кстати интересно, в продолжении про субсидии, они же тут недавно хлопнули по рукам при закладке фабрики на 60ГВт*ч (в

<https://www.pv-magazine.com/2024/03/27/northvolt-breaks-ground-on-60-gwh-gigafactory-in-germany/>

Northvolt breaks ground on 60 GWh gigafactory in Germany

Europe's leading battery maker, Northvolt, has started building a battery cell factory in Heide, Germany. The facility will employ roughly 3,000 people with a maximum annual production capacity of 60 GWh. It will begin operations in 2026.

MARCH 27, 2024 **MARIJA MAISCH**

ELECTRIC VEHICLES

ENERGY STORAGE

MARKETS

GERMANY



Photo: BMWK / bundesfoto, Christina Czybik

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Swedish battery maker [Northvolt](#) has officially initiated the construction of its gigafactory in Heide, Germany. Once completed, the Northvolt Drei gigafactory will produce 60 GWh of battery cells per year using locally sourced renewable energy.

Plans for Northvolt Drei were first revealed in 2022. The battery maker then secured EUR 155 million (\$167.9 million) of Important Project of Common European Interest (IPCEI) funding for construction. In January of this year, the European Commission approved [EUR 902 million](#) of German government funding under the state aid law.

"Without the aid, Northvolt would establish the plant in the United States, where support was offered in particular under the Inflation Reduction Act," said the European Commission.

Не обошлось как обычно для зелени - без субсидий, тут еще и геополитота примешивается если бы еврокомиссары были на большом острове.

PRESS RELEASE | 8 January 2024 | Brussels | 8 min read

Commission approves €902 million German State aid to support Northvolt in the construction of an electric vehicle production plant to foster the transition to a net-zero economy

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The European Commission has approved a **€902 million** German State aid to support Northvolt in the construction of an electric vehicle production plant for the production of batteries for electric vehicles to foster the transition to a net-zero economy under the [Green Deal Industrial Plan](#). The aid was approved under the State aid rules adopted by the Commission on [9 March 2023](#) and amended on [20 January 2024](#), which are key to accelerate the green transition and reduce fuel dependency.

The German measure

Germany notified the Commission, under the Temporary Crisis and Transition Framework, to support Northvolt in the construction of a production plant for advanced battery technology in the city of Heide. The plant will have an annual capacity of 60 GWh of battery cells for electric vehicles per year, depending on the size of the battery. The plant will have a production capacity in 2029.

Under the measure, the aid will take the form of a **€700 million direct grant**. If the aid, Northvolt would establish the plant in the United States, where the Inflation Reduction Act.

The Commission found that the German measure is in line with Article 107(3)(c) of the Treaty on the Functioning of the European Union (TFEU) under the Temporary Crisis and Transition Framework, in particular Section 2.1.1, which allows for accelerated investments in sectors strategic for the transition towards a net-zero economy.

https://ec.europa.eu/commission/presscorner/detail/en/ip_23_6823

Почти миллиард евроков.

Тупо грант.

Вот Вам и рыночек, вот Вам и конкуренция.

По Российскому литию:

РЭНЕРА, отраслевой интегратор Росатома по накопителям энергии (входит в ТВЭЛ, топливный дивизион Росатома) с октября 2024 г. строит батареи в Калининградской области на площадке недостроенной и замороженной в 2013 г. Балтийской атомной электростанции. Мощность гигафабрики на 1м этапе составит 4 ГВт·ч/год (это позволит обеспечить литий-ионными батареями до 50 тыс. электропродукцию возможно введение 2й и 3й очередей до достижения суммарной мощности производства 14 ГВт·ч.

Причем тут в игру, кроме геополитоты (конкуренция между Китаем, США и ЕС идет не на шутку в этом вопросе), могут вмешаться и другие страны. Они строят эти гигафабрики под вообщем то старые технологические стеки.

Впрочем возможно апгрейд, как и конверсия туда сюда, заложены - просто важна логистика и трудресурсы.

В любом случае масштабы колоссальные трансформации, если все до конца доведут.

P.S.

Да и у "литий-металлических" батарей (<https://globalenergyprize.org/ru/2024/01/26/litij-metallicheskie-akkumuljatory-sohranjajut-80-emkosti-posle-6-000-ciklov-zarjada-razrjada>)

1) ценник

2) нестабильность (с которой как стало модно в наше время стали бороться с помощью ИИ (вспоминаем тему про плазму <https://...> диагностика и прч)

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