



Kompetenzzentrum
Öffentliche IT

Gefördert durch:



Bundesministerium
des Innern, für Bau
und Heimat

 **Fraunhofer**
FOKUS

Jens Tiemann

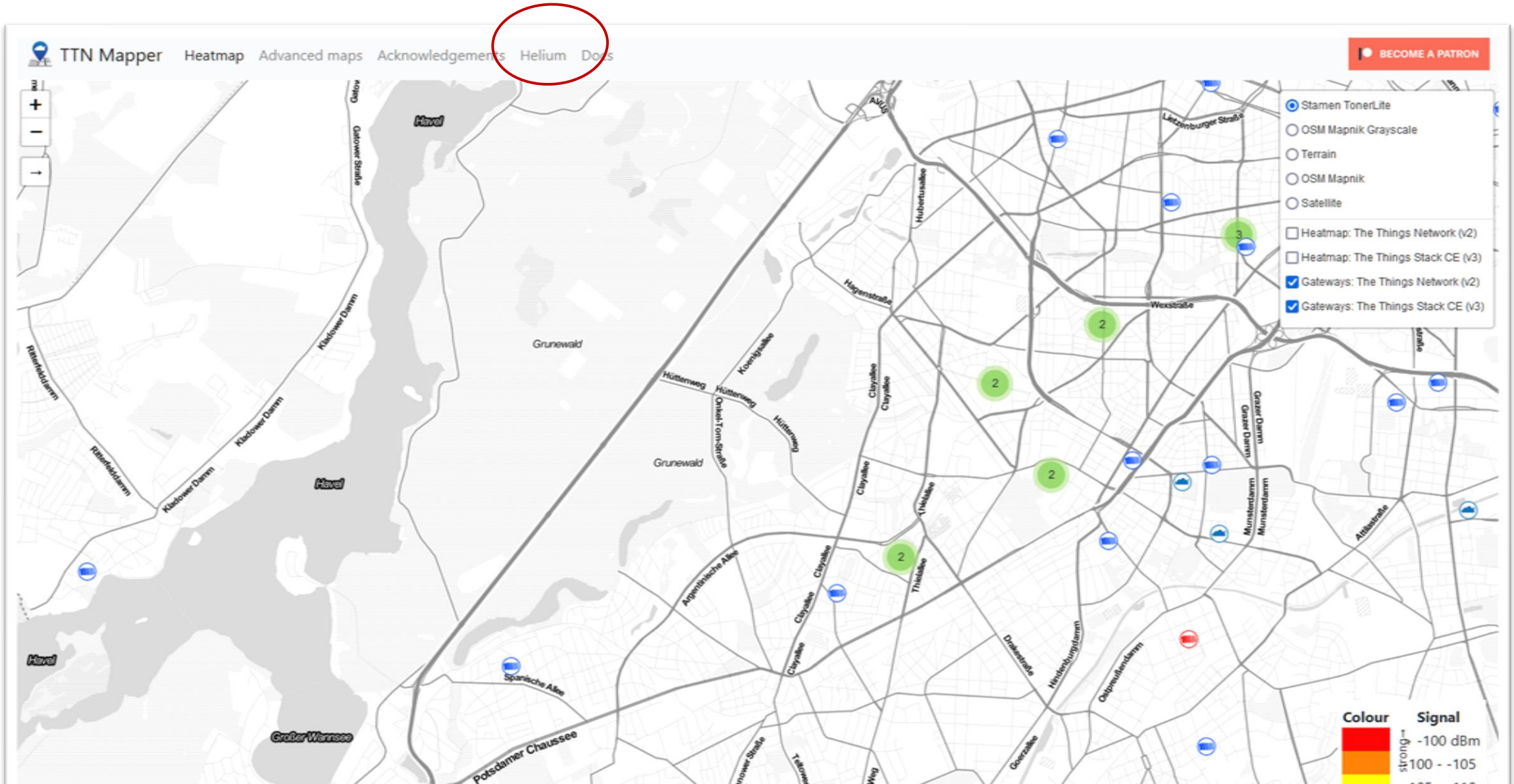
Helium als IoT-Netz-Infrastruktur

Abdeckung und konkrete Nutzbarkeit

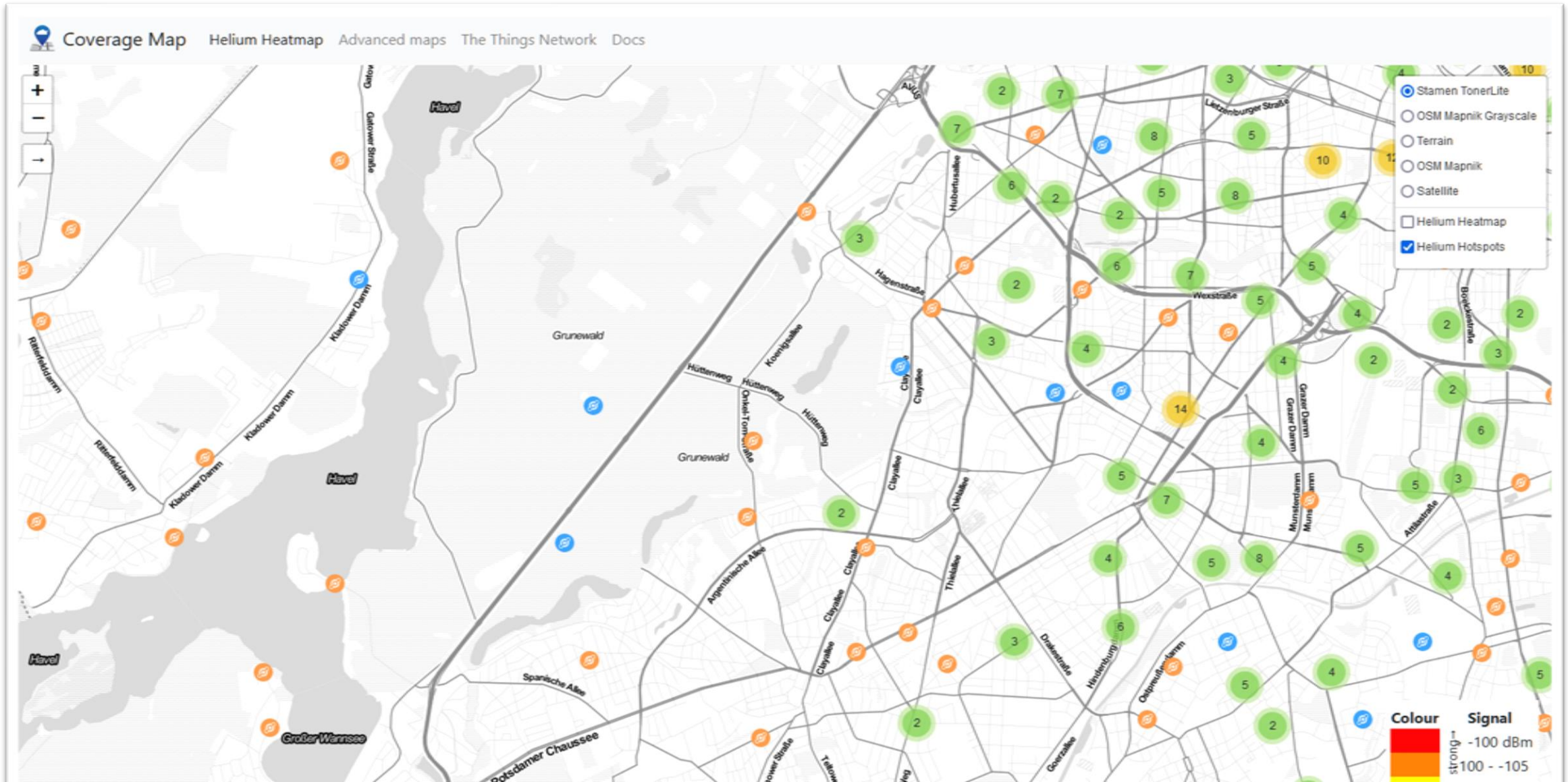
Treffen der Berliner TTN-Community, 4. März 2022

www.oefit.de

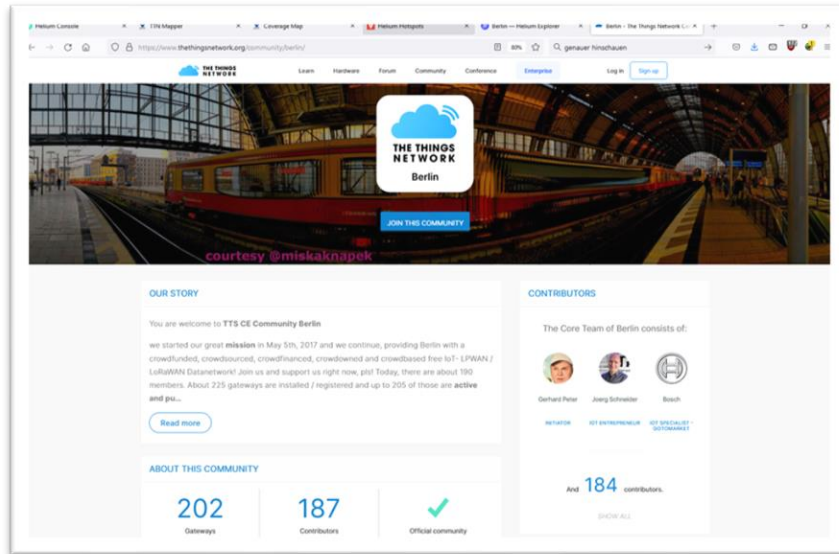
Der gewohnte Anblick: The Things Network



Helium-Hotspots in Berlin-Südwest

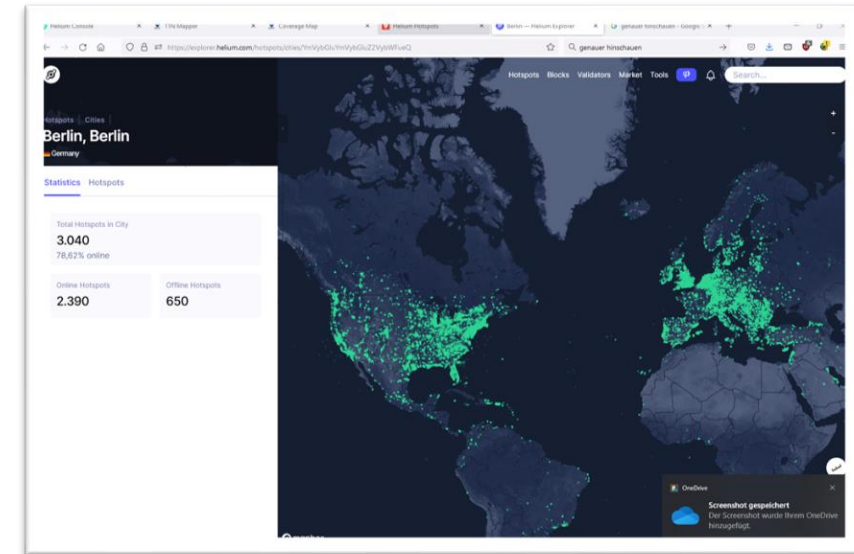


zwei (bekannte) LoRaWAN-Netze in Berlin



TTN-Community Berlin

- existiert seit einigen Jahren
→ ca. 200 Gateways
- offenes, nicht-kommerzielles Netz
- kostenfreie Nutzung

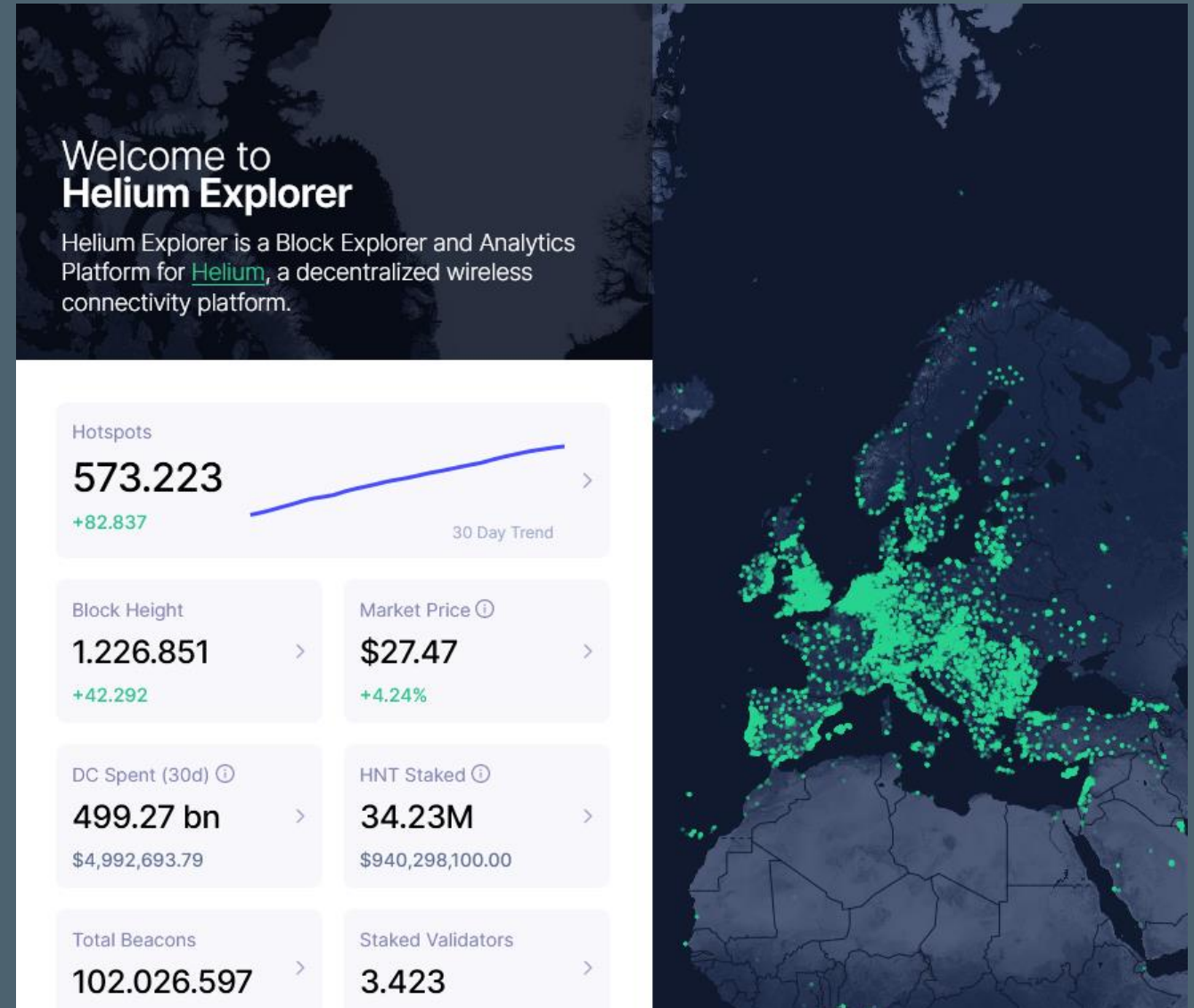


Helium, Zuordnung „Berlin“

- letzte Monate rasantes Wachstum
→ ca. 3000 Hotspots
- eigene Beschreibung: „public network“
- Nutzung: 24 Byte → \$.00001
1€ / Jahr → alle 5 min ein Paket

Informationen über Helium-Netzstatus

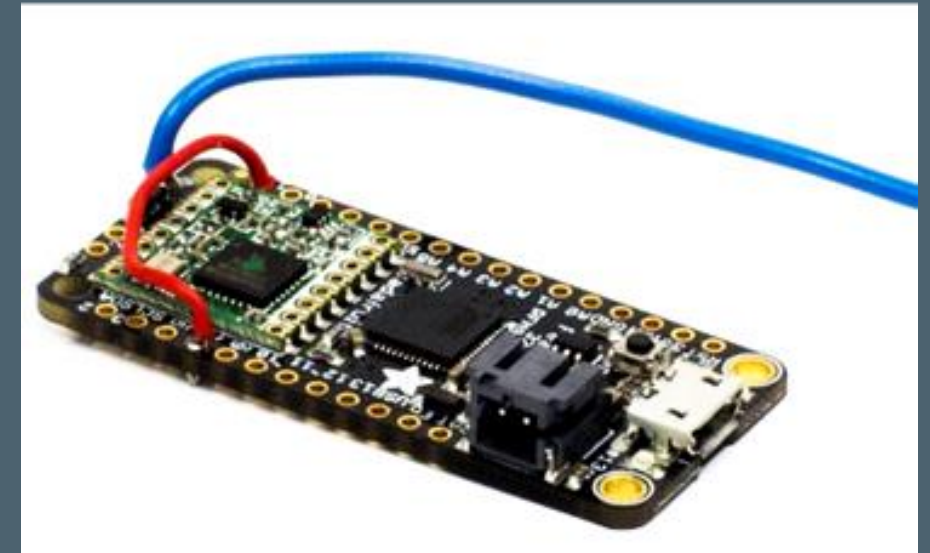
- „TTN-Mapper“
 - Coverage Map für Helium
 - <https://coveragemap.net>
- Helium Explorer
 - Infos über Hotspots, Beziehungen zwischen Hotspots, ...
 - <https://explorer.helium.com>



<https://explorer.helium.com>

Verfügbarkeit von Helium?

- Aufbau eines LoRaWAN-Nodes (OTAA)
 - Adafruit Feather 32u4 with LoRa
- HW/SW-Test in The Things Network
- Registrierung des Nodes in Helium
 - Eintragen in Helium Console
 - warten auf JOIN (ca. 15 min)
 - Auswertung der Daten in Helium



Adafruit Feather 32u4 LoRa, Foto: ÖFIT

Helium Console: Pakete empfangen

Flows

NODES

Devices <

Functions

Integrations

CONFIGS

Alerts

Profiles

Multiple Packets

ADMIN




Coverage

Organizations

Data Credits

Users










My Devices

 All Devices
1 Devices



feather32u4-helium

Delete Device

DEVICE DETAILS

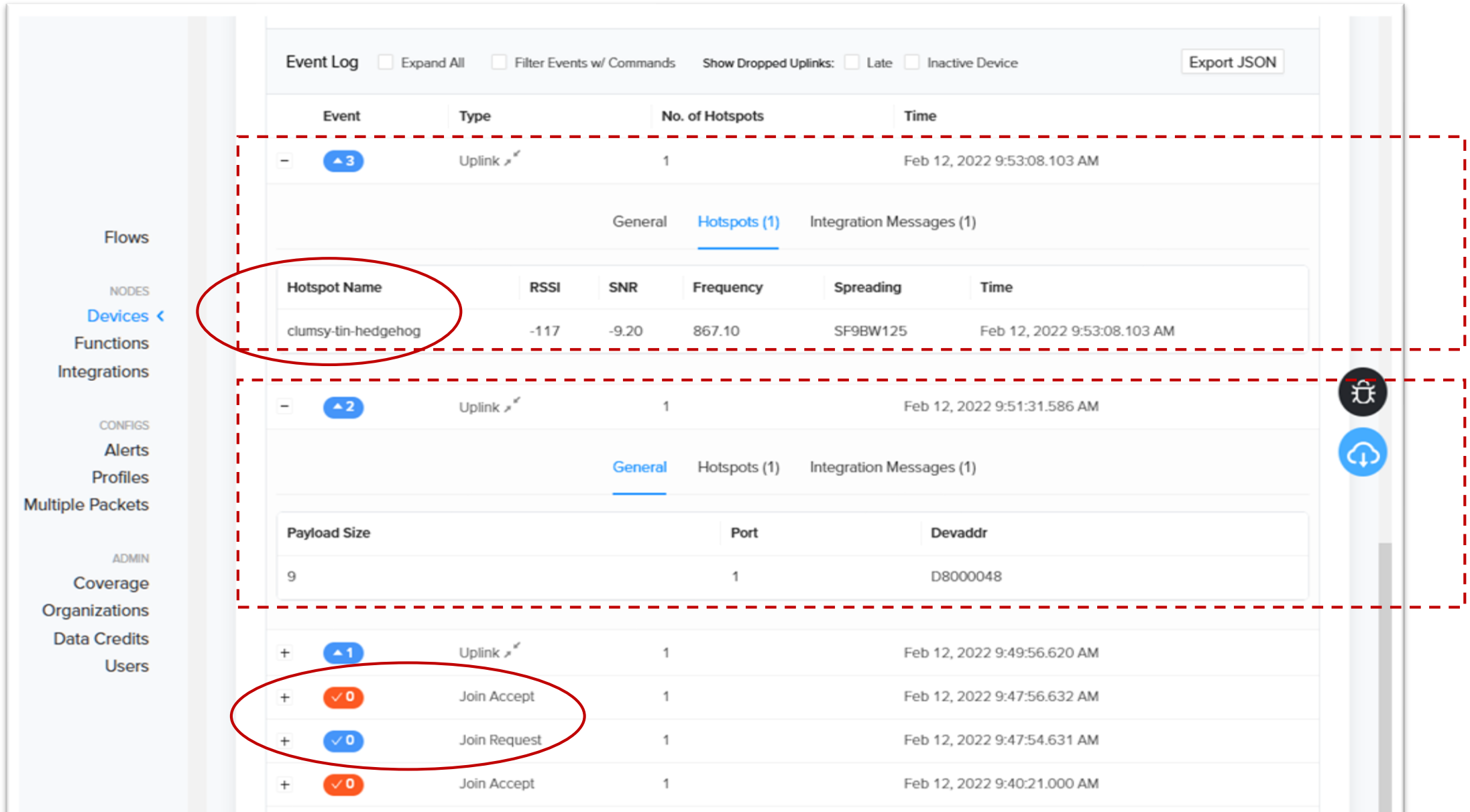
Name	feather32u4-helium 		
ID	a5fbf230-9e8a-4fe9-8a9b-fd21ec6883a5		
Device EUI	 6081F9622E97C064		
App EUI	 6081F977958A7961		
App Key 	*****		
Activation Method	OTAA		
Profile	None 		

PACKETS TRANSFERRED

	DC USED
All Time	Last 7 Days
5	5
Last 30 Days	Last 24 Hours
5	5

0 LABELS ATTACHED
+ Add Label

Helium Console: Paket-Metadaten



Event Log Expand All Filter Events w/ Commands Show Dropped Uplinks: Late Inactive Device Export JSON

Event	Type	No. of Hotspots	Time														
- ▲3	Uplink ↗	1	Feb 12, 2022 9:53:08.103 AM														
<div style="display: flex; justify-content: space-around;"> General Hotspots (1) Integration Messages (1) </div> <table border="1"> <thead> <tr> <th>Hotspot Name</th> <th>RSSI</th> <th>SNR</th> <th>Frequency</th> <th>Spreading</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>clumsy-tin-hedgehog</td> <td>-117</td> <td>-9.20</td> <td>867.10</td> <td>SF9BW125</td> <td>Feb 12, 2022 9:53:08.103 AM</td> </tr> </tbody> </table>						Hotspot Name	RSSI	SNR	Frequency	Spreading	Time	clumsy-tin-hedgehog	-117	-9.20	867.10	SF9BW125	Feb 12, 2022 9:53:08.103 AM
Hotspot Name	RSSI	SNR	Frequency	Spreading	Time												
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- ▲2	Uplink ↗	1	Feb 12, 2022 9:51:31.586 AM														
<div style="display: flex; justify-content: space-around;"> General Hotspots (1) Integration Messages (1) </div> <table border="1"> <thead> <tr> <th>Payload Size</th> <th>Port</th> <th>Devaddr</th> </tr> </thead> <tbody> <tr> <td>9</td> <td>1</td> <td>D8000048</td> </tr> </tbody> </table>						Payload Size	Port	Devaddr	9	1	D8000048						
Payload Size	Port	Devaddr															
9	1	D8000048															
+ ▲1	Uplink ↗	1	Feb 12, 2022 9:49:56.620 AM														
+ ✓0	Join Accept	1	Feb 12, 2022 9:47:56.632 AM														
+ ✓0	Join Request	1	Feb 12, 2022 9:47:54.631 AM														
+ ✓0	Join Accept	1	Feb 12, 2022 9:40:21.000 AM														

Genutzter Hotspot

Hotspots Berlin 881f1...

Clumsy Tin Hedgehog

Bobcat 8 dBi 10 m
11KEZ9X... NwoGqTp 12ww3At...

Statistics Activity Witnessed Nearby

Hotspot is relayed. Expect lower earnings. Fix it →

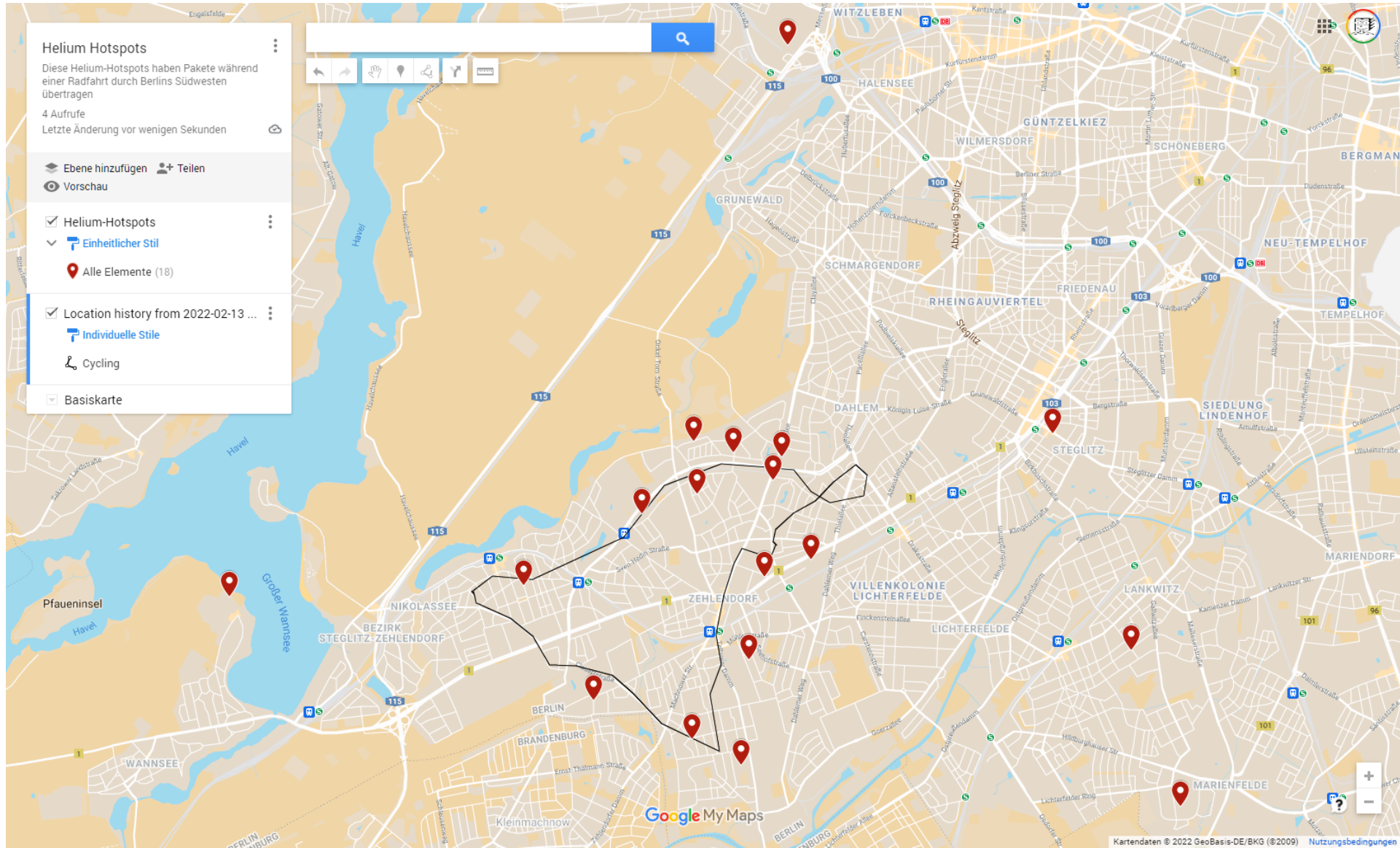
Transmit Scale 1,00 No Change
Sync Status Synced Last Updated 21 hours ago

Earnings (UTC) 0,056 \$1.51 -57,395 %
24H 7D 14D 30D

7D Avg Beacons 53 +51,429 %
Total Witnessed 5 Within past 5 days

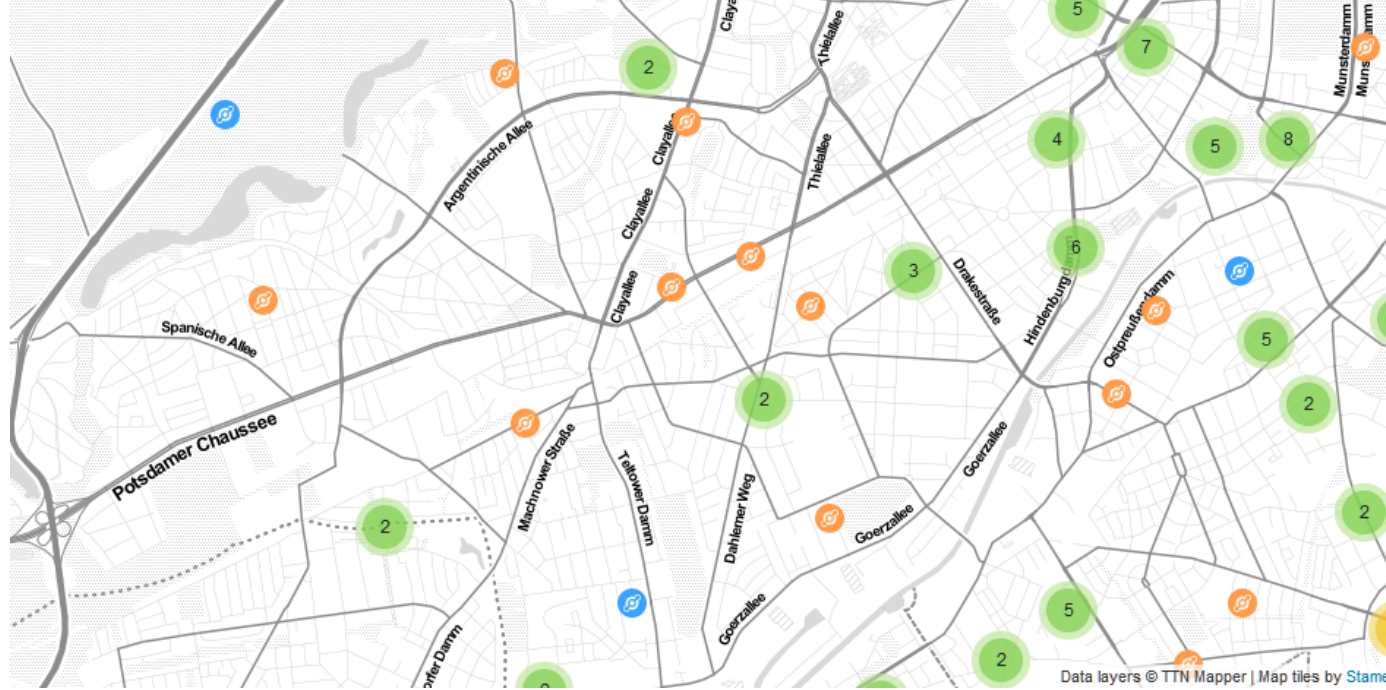
mapbox

Radstrecke und Hotspots



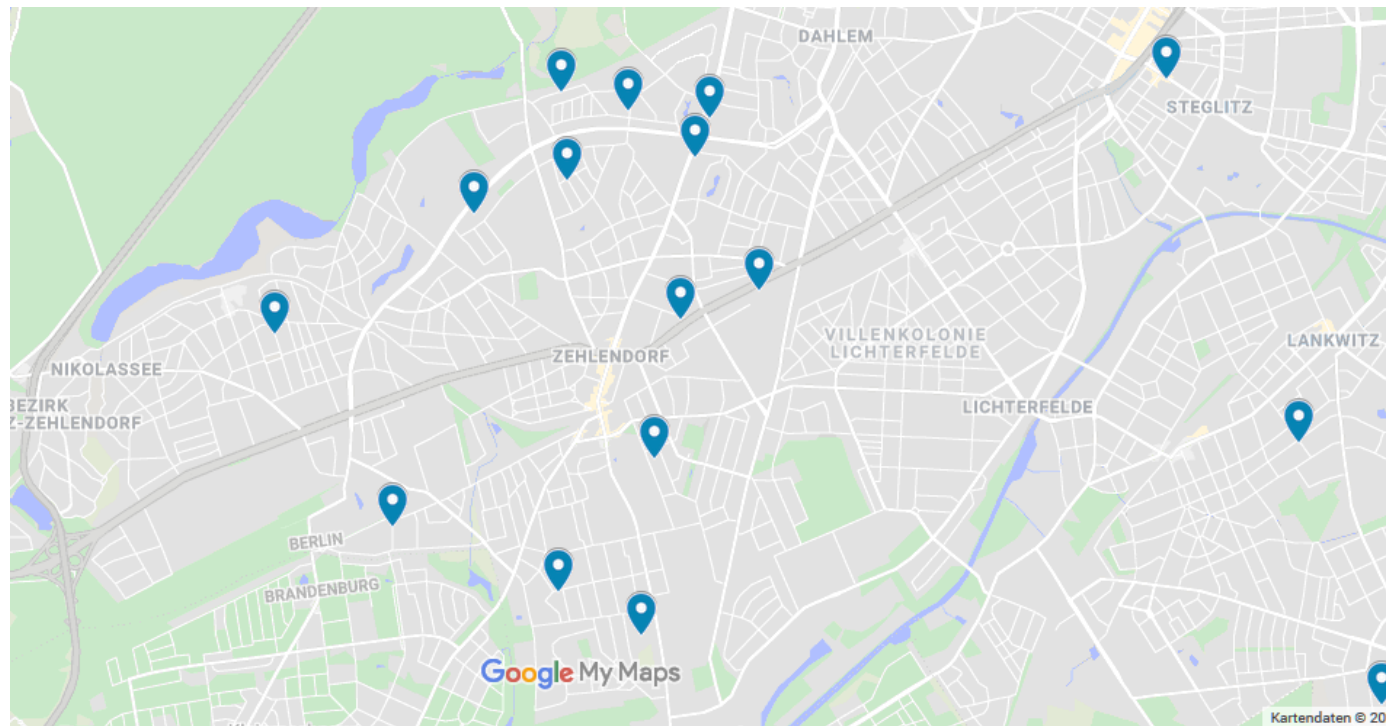
Vergleich

kartierte Hotspots



ttnmapper

genutzte Hotspots



helium explorer



Kompetenzzentrum
Öffentliche IT

Gefördert durch:



 **Fraunhofer**
FOKUS

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Vielen Dank für Ihre Aufmerksamkeit!

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