

AQC – Air-Quality-Chain

Blockchain based proof for environmental data

"Air-Quality-Chain" is a system for **logging, immutable storage and decentralized distribution** of environmental data based on the blockchain technology.

The key features of blockchain technology are: **decentralization** (no trusted third party necessary, resilient network and database systems), **transparency** ("single truth" for all participants) and **immutability** (data can never be deleted).

In AQC they are used to reach the following goals:

- AQC allows to transparently track environmental data from many sources.
- It then allows to distribute & publish this data.
- It proofs immutability of stored data, so that
- no manipulation is possible and no more misreporting occurs.

Every AQC-stakeholder shall participate by running a blockchain node. There are two types of nodes:

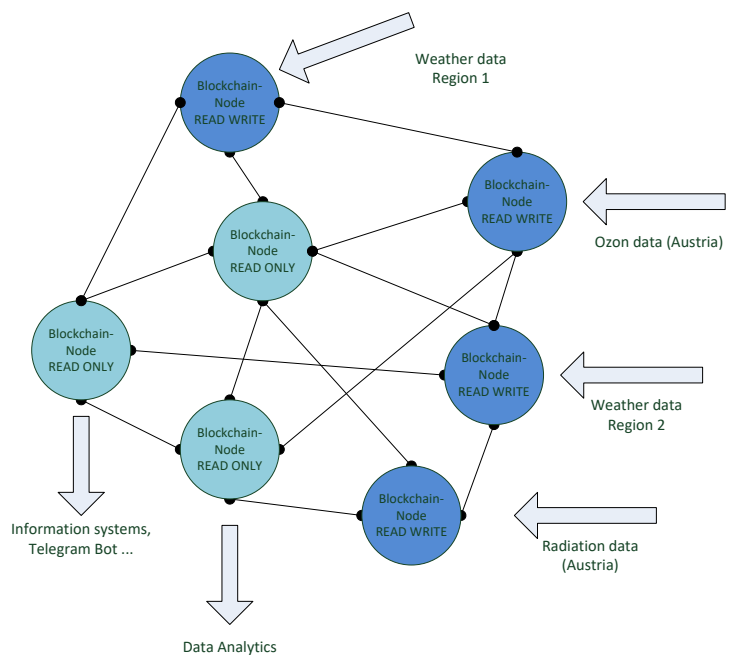
- Authorized ("known") nodes with read/write access add data.
- (Anonymous) read only nodes for data analytics, information systems etc.

Blockchain consensus is reached with „proof of authority“. This means, that NO energy intensive mining is necessary!

Current situation: We have been running a test system since 3/2018, where the measurement data of the air monitoring network of the city of Vienna, the current ozone data of Austria and the measured values of the radiation early warning system are processed. This data is periodically queried and stored in the AQC blockchain. The data includes: temperature, humidity, wind, nitrogen oxides, ozone, sulfur dioxide, carbon monoxide and particulate matter.

During this one year test period we gained practical expertise in running such blockchain systems and developed and tested a lot of software modules, interfaces etc.

To visualize the recorded data we built a couple of webpages, examples are shown here:



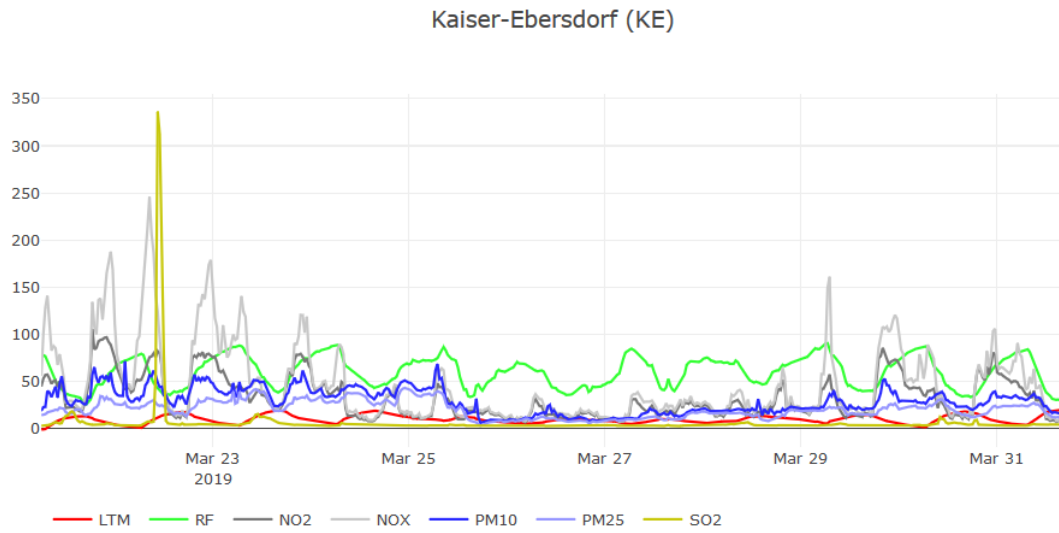
Example of time series diagram

AQC (Air Quality Chain) Testsystem: Messdaten Wien

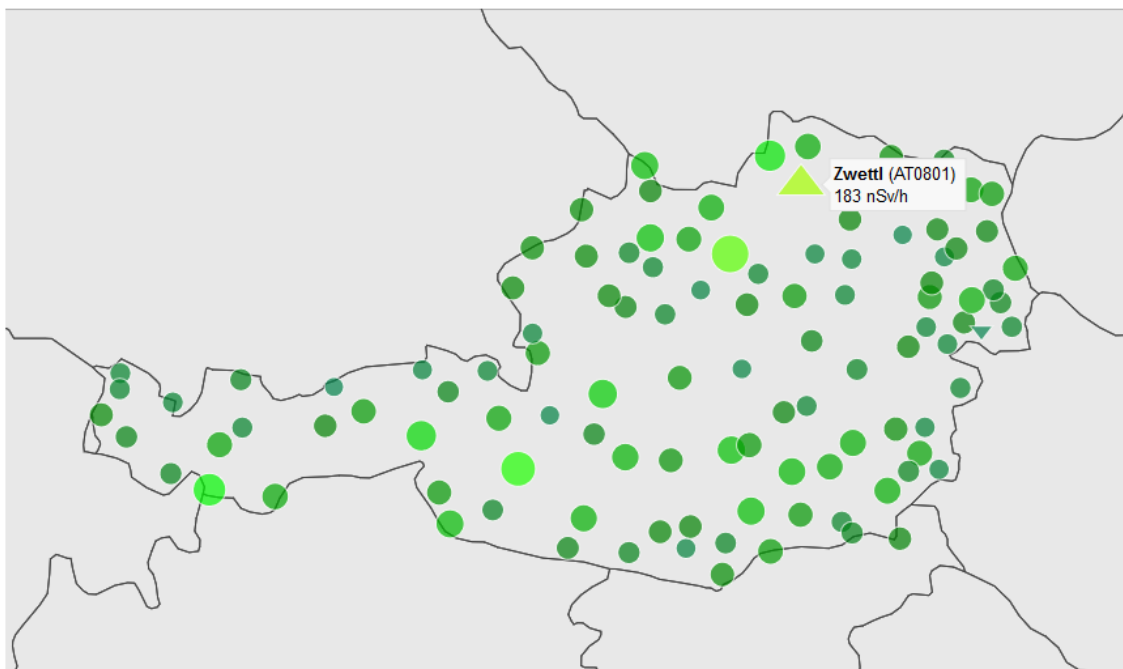
Kurzbeschreibung

Stationen: STEF | TAB | AKA | AKC | BELG | LAA | **(KE)** | A23 | GAUD | MBA | KEND | SCHA | JAEG | ZA | FLO | LOB | STAD | LIES | BC21 |

Navigation: first - prev - next - last



Example of map view (radiation data)



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<https://datnos.com/aqc>