



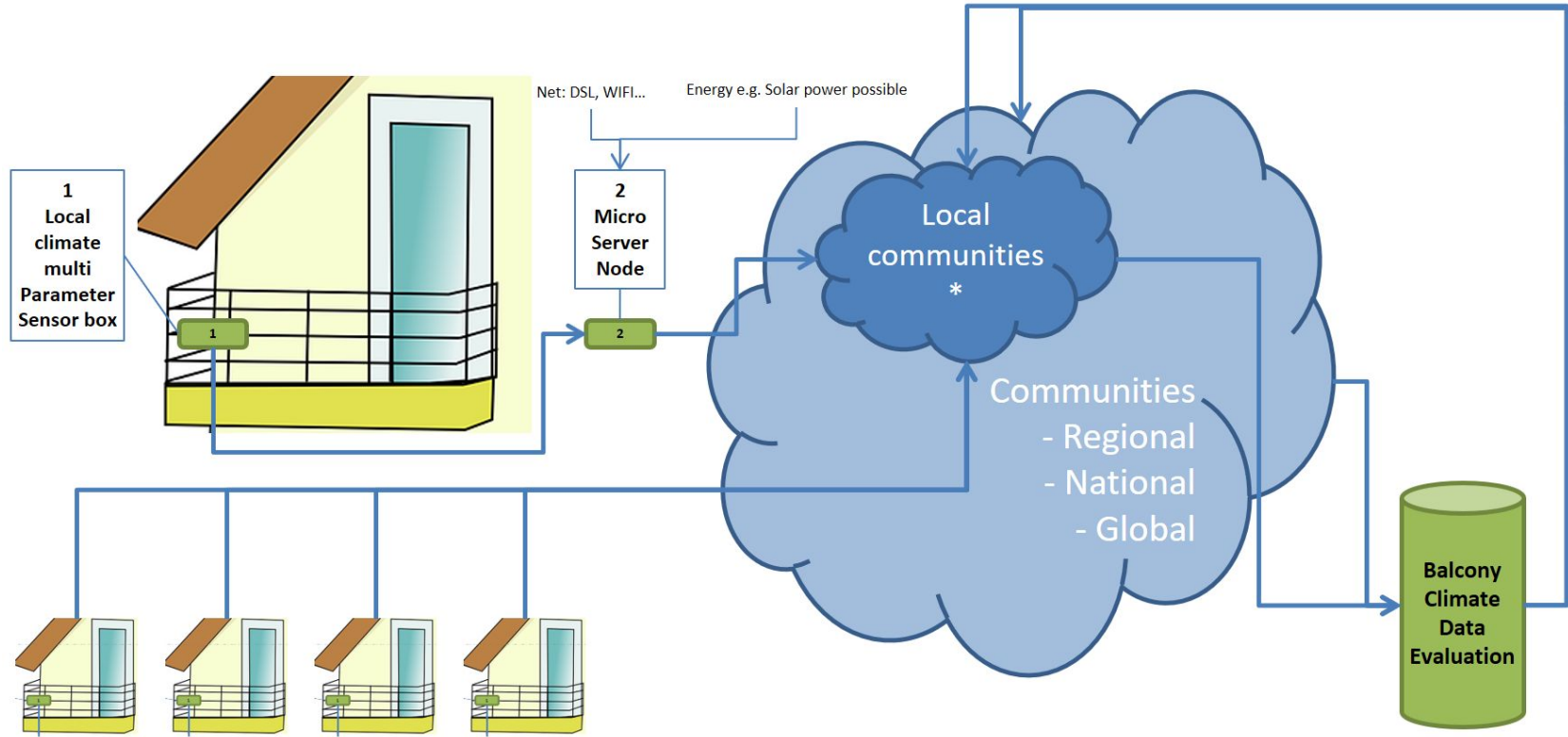
Blockchain / IoT Project application
for residents and communities

Climate & environment research

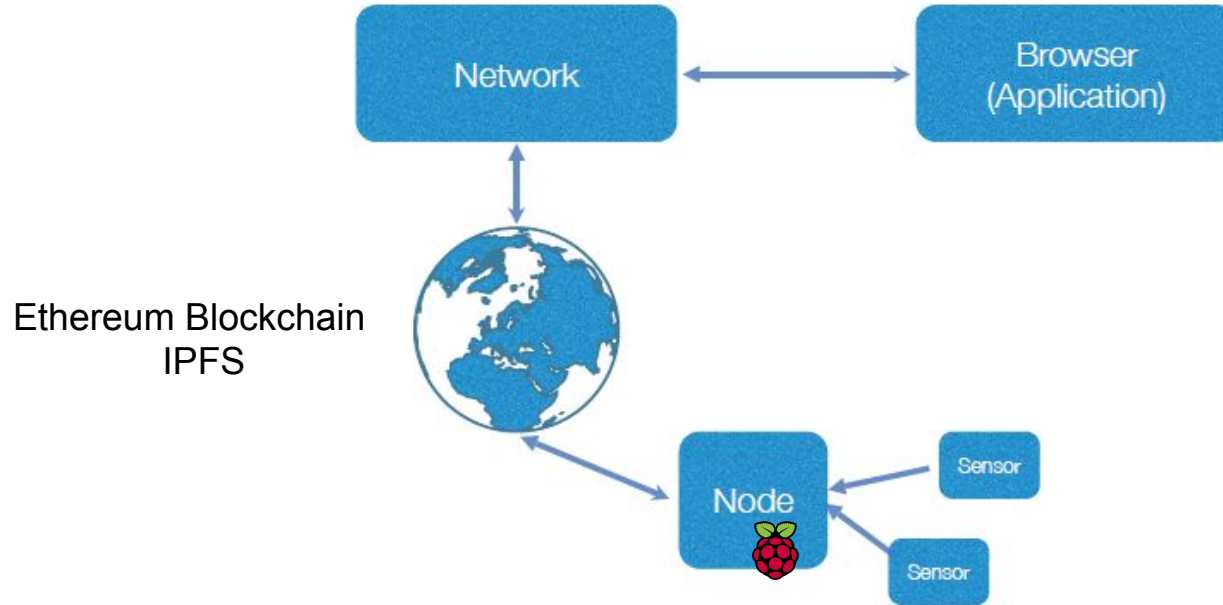
Project Approach

- Bring BalconyClimate enthusiasts and first movers together
- Measure and monitor climate parameters with aim to show the local relevance for community participants
- Initiate local communities and enable them to evaluate, interact, vote and take action on climate and living quality
=> Power to the crowd
- Initiate effective regional projects that have positive and measurable effects on personal habitat quality and climate change.

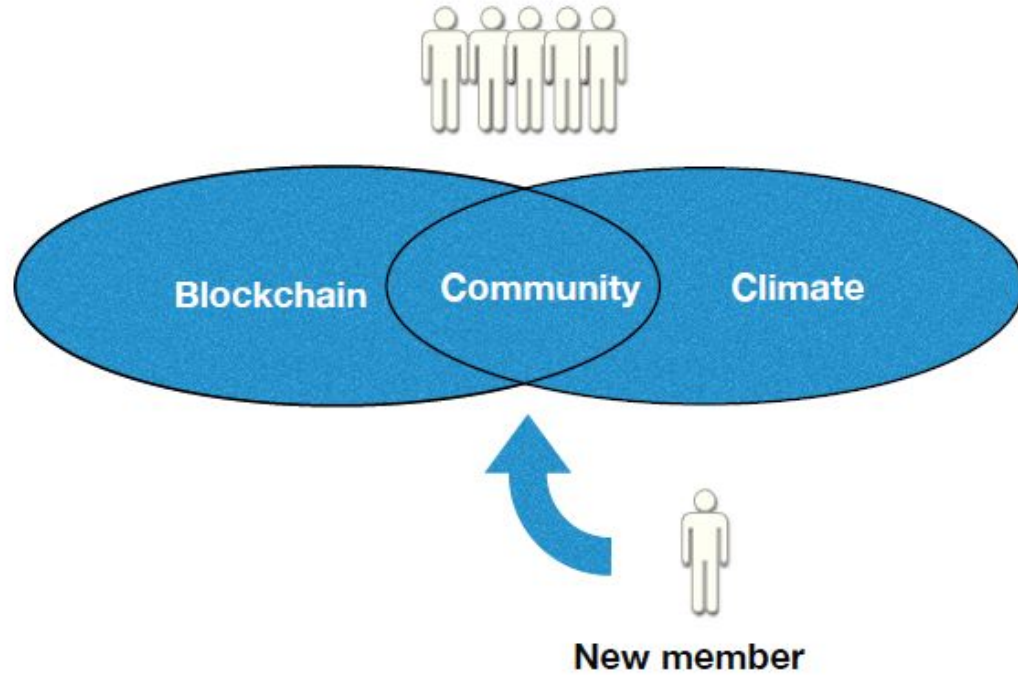
Function Overview



Architecture



Community



Challenge (Personal problem)

- I (We) do not have any information about the climate on my (our) balcony.
- Is it healthy, to use the outside „living room“ of my apartment / house? e.g.
 - to hang out a spend time in my private outside area
 - to dry laundry
- I would like to have a Comfort App

Challenge (systemic problem)

- Lack of awareness and importance of local action
„They will take care about climate at COP23, won't they?“
- Lack of basic knowledge on air quality parameters
„Is it healthy to use the outside „living room“ of my apartment / house? Maybe I shall stay inside?“
- Lack of trust in available data
„I do not have any information about the climate parameters on my balcony. Can I trust the official measurements?“

Why Now

- ... because climate change is happening now. Any further delay increases the risk of disaster.
- ... because the necessary technology (Blockchain) is now available
- ... because especially social projects in connection with IoT / validatable data are highly relevant right now

Screenshots sensors & nodes

```
pi@balconyapi02: ~/balcony_climate/node_modules/sds011-wrapper/examples
pi@balconyapi02:~/H4CChain $ cd ../balcony_climate/
pi@balconyapi02:~/balcony_climate $ cd node_modules/sds011-wrapper/examples/
pi@balconyapi02:~/balcony_climate/node_modules/sds011-wrapper/examples $ node activate-mode.js
Sensor is now working in active mode.
Working period set to 0 minutes.

Sensor readings:
[2017-11-15T10:26:35.487Z] {"PM2.5":9.6,"PM10":11.6}
[2017-11-15T10:26:36.486Z] {"PM2.5":9.6,"PM10":11.5}
[2017-11-15T10:26:37.485Z] {"PM2.5":9.5,"PM10":11.5}
[2017-11-15T10:26:38.485Z] {"PM2.5":9.5,"PM10":11.4}
[2017-11-15T10:26:39.484Z] {"PM2.5":9.5,"PM10":11.4}
[2017-11-15T10:26:40.484Z] {"PM2.5":9.4,"PM10":11.3}
[2017-11-15T10:26:41.483Z] {"PM2.5":9.3,"PM10":11.2}
[2017-11-15T10:26:42.483Z] {"PM2.5":9.2,"PM10":11.2}
[2017-11-15T10:26:43.482Z] {"PM2.5":9.1,"PM10":10.8}
[2017-11-15T10:26:44.482Z] {"PM2.5":9.1,"PM10":10.4}
[2017-11-15T10:26:45.481Z] {"PM2.5":9.1,"PM10":10.4}
[2017-11-15T10:26:46.481Z] {"PM2.5":9.1,"PM10":10.4}
[2017-11-15T10:26:47.480Z] {"PM2.5":9.1,"PM10":10.3}
[2017-11-15T10:26:48.480Z] {"PM2.5":9.1,"PM10":10.2}
^C
pi@balconyapi02:~/balcony_climate/node_modules/sds011-wrapper/examples $
```

```
pi@balconyapi02: ~/H4CChain
admin.peers
pi@balconyapi02:~/H4CChain $ ./add_nodes.sh
true
pi@balconyapi02:~/H4CChain $ ./peers.sh
[[
  caps: ["eth/62", "eth/63"],
  id: "005d78e92244f689671437911dfff2d5eafd88be4ac3fe9f292684899e5b52b248abfdbe69a7f47006bf575dc8b1f29fb934b4d9f70be4d5af15ff8c215f6cc9b",
  name: "Geth/v1.7.2-stable-1db4ecdc/windows-amd64/go1.9",
  network: {
    localAddress: "192.168.0.226:45964",
    remoteAddress: "192.168.0.253:30303"
  },
  protocols: {
    eth: {
      difficulty: 336271395370,
      head: "0x68202dd1b478e397f66bea79d0666a4de654f3641f89346dda2a0625cab3ec018",
      version: 63
    }
  }
}]
pi@balconyapi02:~/H4CChain $
```

Solutions

Prio 1

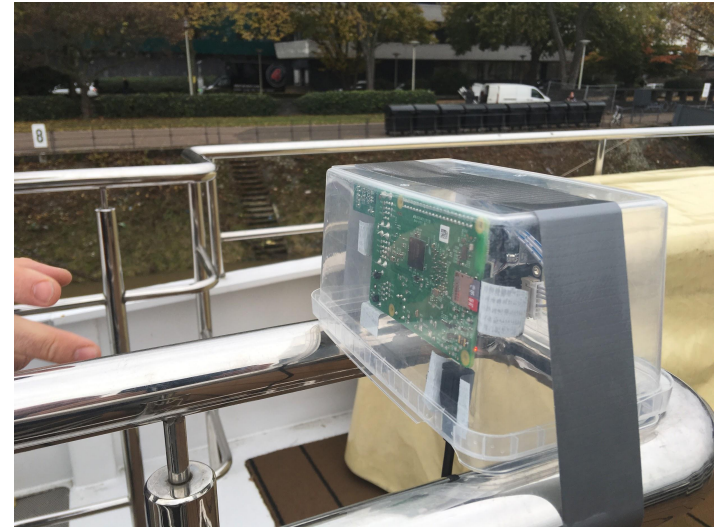
BalconyClimate Solution (Sensors, Blockchain node, (d)App - Map and Cockpit)

Prio 2

BalconyClimate Community initiative

Prio 3

Parameter box (Product development - Sensors, micro computer / node)



Market potential

BalconyClimate solution = Many accounts

Any private household or an office with a balcony, terrace or garden will be able to use the solution

1. Local Climate Data analysis & research
B2B/Education - Depending on available covered regions / communities
2. Real estate BalconyClimate / quality data - constant audit of available data
Deliver quality data for renting / selling / buying purposes
3. Cross selling (HW / Sensors, SW / dApp, connectivity)
→ potentially sponsored

Beginning & Team

Boris developed the #BalconyClimate concept and Blockchain / IoT developers from Bonn and Darmstadt, which knew each other from #BlockchainBonn and #BlockchainDarmstadt meetup community joined. They were selected among 500 applicants, to participate at #Hack4Climate, the UNFCCC Climate Hackathon, which took place while #COP23 in November 2017 in Bonn. Active and sponsor partners were Consensys, IOTA, MIT Media Lab, Volkswagen, DB, SBB, Everledger, Climate ledger, ETH Zurich, Deutsche Telekom...

The initial team made it within the groups of winners at #Hack4Climate #COP23.

That was the start. Some of the #Hack4Climate participants are still committed but only with a funding the project can be further developed effectively.

Vision

- The private balcony is a living space, where people spend time. Therefore it is directly health-relevant and in the interest of the residents, to be informed
- In every country you can find a lot of private balconies with a possible (hot) spot
- The (hot) spot for the „Parameter station“ is mostly localized in a closed private environment under the control of private residents and citizens
- Multi sensors (e.g. RUUVI) gather data with defined attributes like position (GPS, height, sun position, temp...) fixed e.g. at balcony railing
- Most balconies are connected to the internet (DSL, WIFI...) and electricity (necessary for a micro computer / e.g. PI...) In many cases solar powering is possible
- The community is enabled to
 - 1.) communicate and interact
 - 2.) deliver and receive „hard facts“ -> be part of research
 - 3.) participate and incentivate



Summary

Project name	BalconyClimate – Blockchain based research and community Local and Global living environment research and evaluation accompanied with community building activities to take action and improve local (and global) climate.
Project description	Gather and evaluate Climate parameters / data with Multi sensors (e.g. Temp, air condition information, rain, sunshine...) on private and corporate balconies, which are connected to local hosts (Micro server e.g. PI / Node, connected to network via DSL, WIFI, other protocols) and collect weather and air condition data. To store the large amounts of data collected, methods like IPFS (P2P Hypermedia protocol / ipfs.io, Intel SGX, proof of luck) are planned to be used. Blockchain is relevant because of <ol style="list-style-type: none">1) Data protection against forgery (e.g. proof of time) and2) Community (Group consensus, evaluation, voting....) enabled by Smartphone Frontend (d)App (iOS, Android...) The data collection is done for statistic research and qualified feedback to the local communities. For this purpose evaluation and voting tools are developed to support communities in acting against pollution and climate change. The realisation is intended to use Ethereum as a blockchain components.

Synergies & Strategic Partners

- Seed / Private Investment
- Cooperation with industries / Formation Consortia
 - Telecommunication / IT (e.g. Deutsche Telekom, Vodafone, Telefónica, IBM...)
 - International Organisations (e.g. UNFCCC), Municipal government (Bonn, Darmstadt...)
 - German Ministries of Environment (e.g. Federal Government, NRW, Hesse)
 - Real estate companies, Associations of private Property owners (e.g. Vonovia...)
 - Electronic commerce / DIY stores (e.g. Conrad, Obi, Bauhaus...)
 - Finance partners (e.g. Bank, Insurance...)
 - Others
- Crowd Funding / Building Communities
- Public Funding (e.g. EU, National / Regional budgets)
- Strategic Investment (e.g. IPO / ICO...)

Contact

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