



FAIR: A project to make weather information more usable

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Data Week 2022

06.07.2022 (11:45 – 12:00)

CISS TDI GmbH

<https://www.fair-opendata.de>



about us

*The greatest sight there is is the world
- go see it.*

- Kurt Tucholsky





CISS TDI GmbH



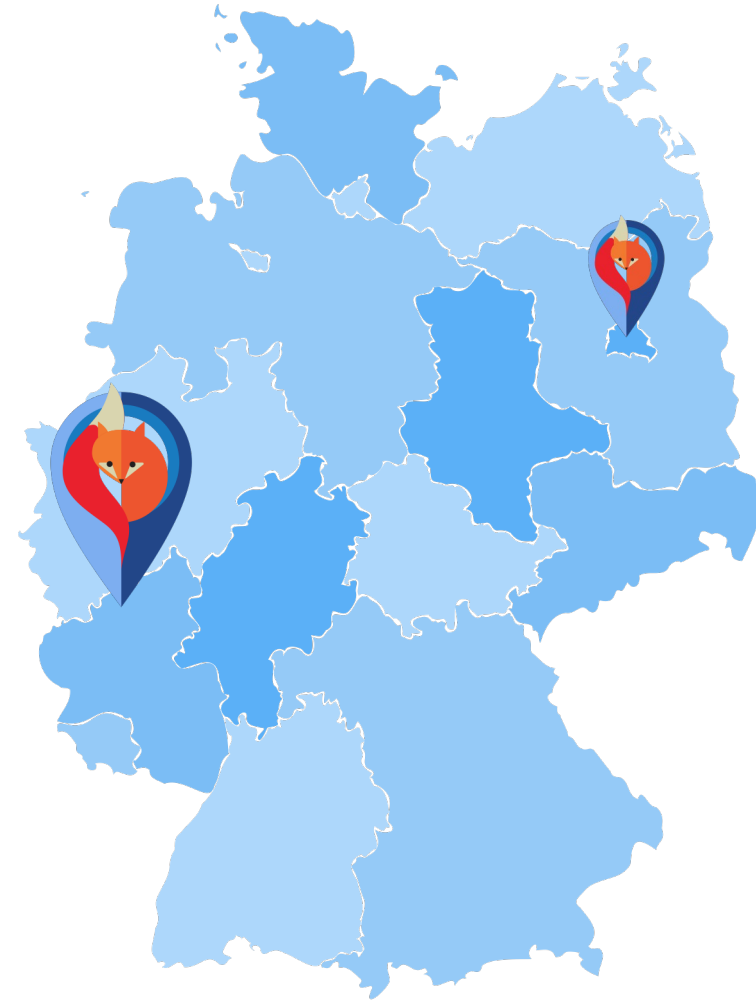
Established: 1982



HQ: Sinzig / Rhein



Employees: ~37



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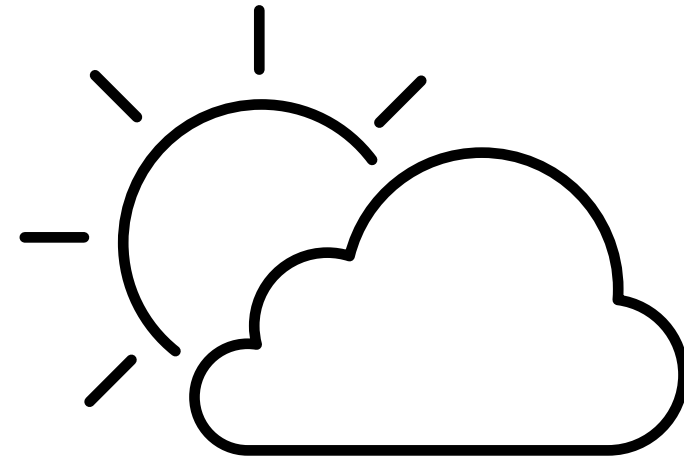
c.frank@ciss.de

www.ciss.de

motivation

Why to talk about weather?

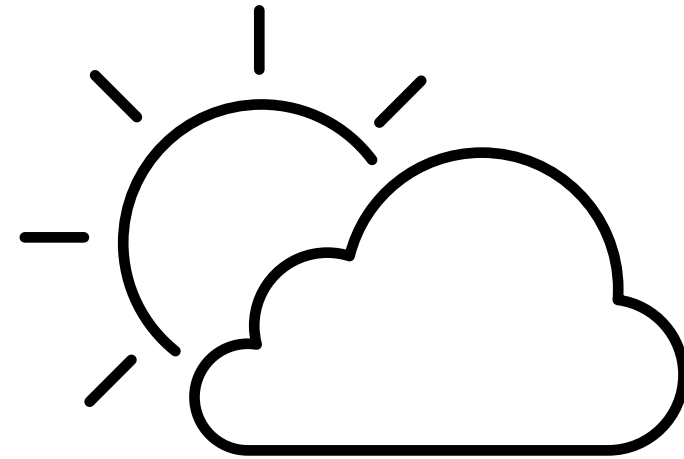
*It's the #1 topic for small talk.**



*So, after this presentation,
let's talk about weather ;)*

Why to talk about weather?

*Around 80% of the world-wide economy depends on weather conditions (and the climate).**





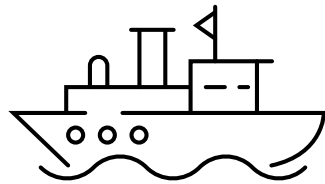
Why to talk about data?

Open data is the basis for new business ideas,

allow for economic growth

*and support innovation in business, administration
and society.**

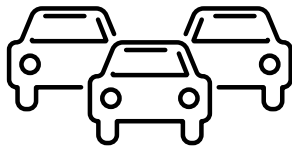
Where is the data coming from?



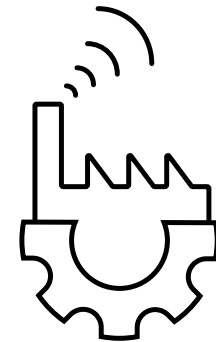
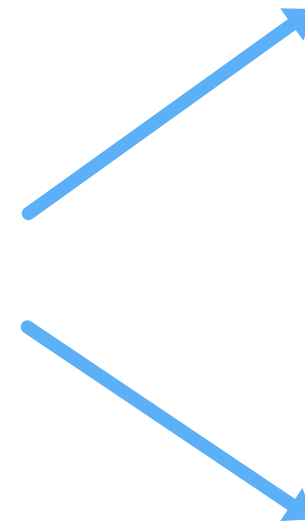
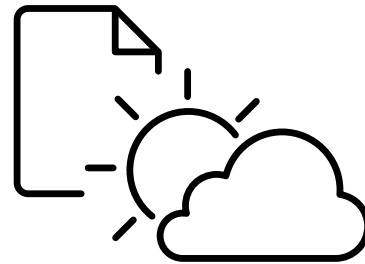
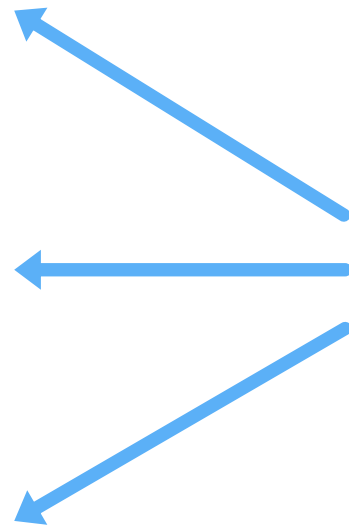
transport



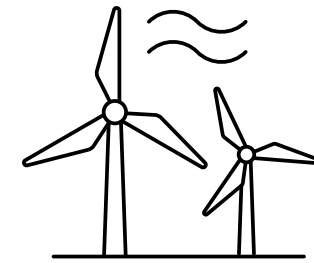
air traffic



traffic

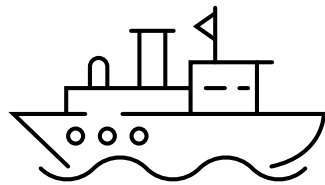


industry



energy

What is the task of the German weather service?



transport



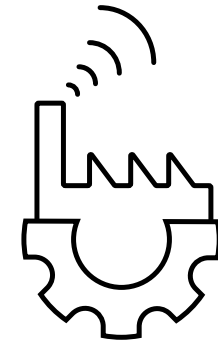
air traffic



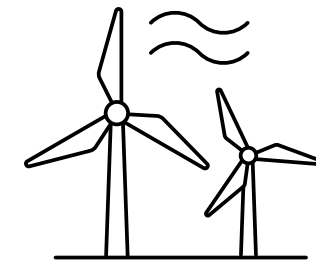
traffic



Deutscher Wetterdienst
Wetter und Klima aus einer Hand



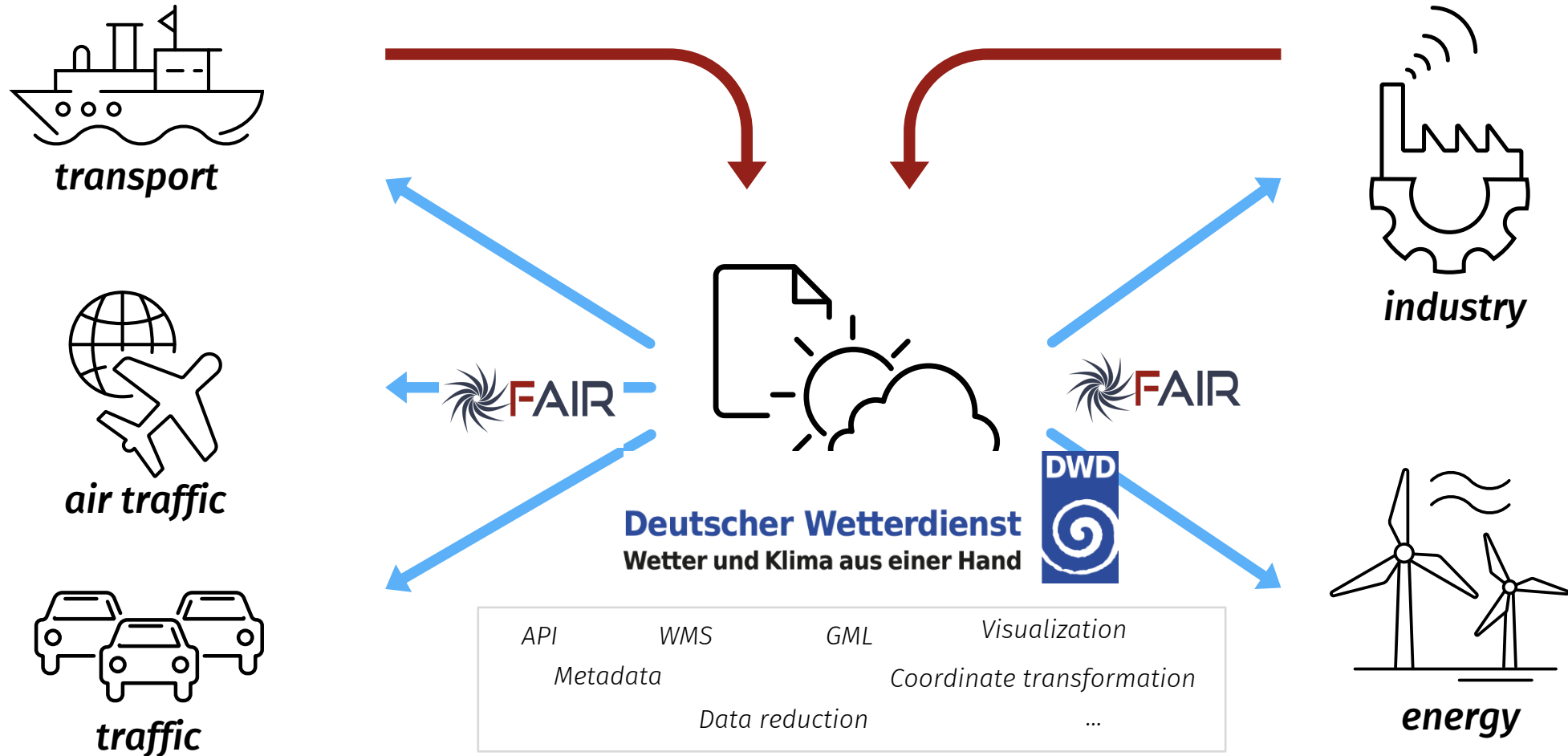
industry



energy

Offer open geo data and allow usage for third parties.

What is the goal of the project?



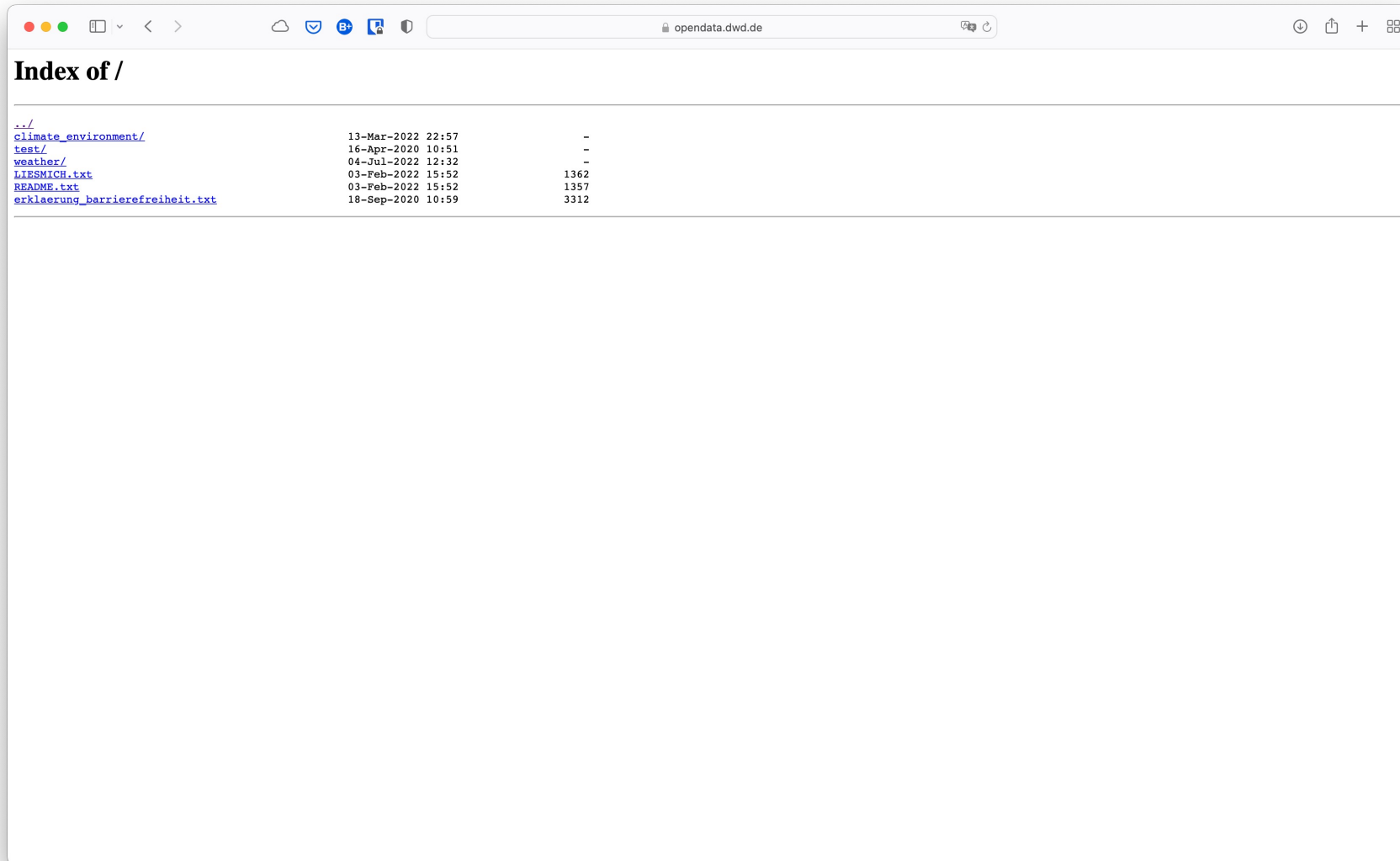
Target: Make weather information of the DWD more usable



current situation



Access open data via <https://opendata.dwd.de>





Access open data via <https://opendata.dwd.de>

so we're done, aren't we?

(I think next on the agenda is lunch anyways)



Current situation in Germany

Nice: Open weather data is available!

Not so nice: Just a part of the data is handy to use

Most data is published at <https://opendata.dwd.de/>

Still challenging

- Little Metadata
 - Few Interfaces
 - Huge Data files
 - No (on demand) pre-processing
- Additional resources are required for processing and integration of the provided data

The screenshot shows a web browser window with the URL <https://opendata.dwd.de/>. The page title is "Index of /". The content is a table listing data files with their names, last modification dates, and sizes.

File Name	Last Modified	Size
./		
climate_environment/	13-Mar-2022 22:57	-
test/	16-Apr-2020 10:51	-
weather/	04-Jul-2022 16:32	-
L15PM10U.txt	03-Feb-2022 15:52	1362
README.txt	03-Feb-2022 15:52	1357
srkiaszuzg_barrierefreiheit.txt	18-Sep-2020 10:59	3312



FAIR approach



The FAIR-enrichment process

<https://opendata.dwd.de/>

Aquire

- Automatic download
- Automatic updating

Process

- Coordinate transformation
- Remove redundancy and unneeded data
- Enrichment (e.g., wind speed and direction) with further sources
- Import to PostGRES for accessing, filtering, ...

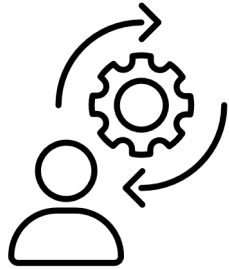
Provide

- FAIR-Portal
- API
- Apps

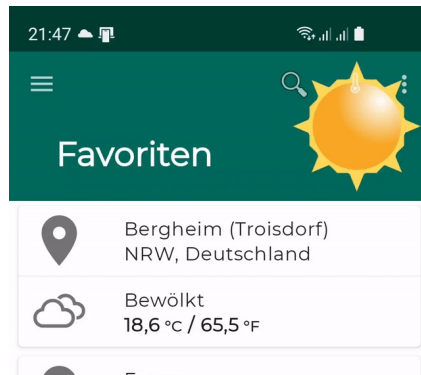


The FAIR applications

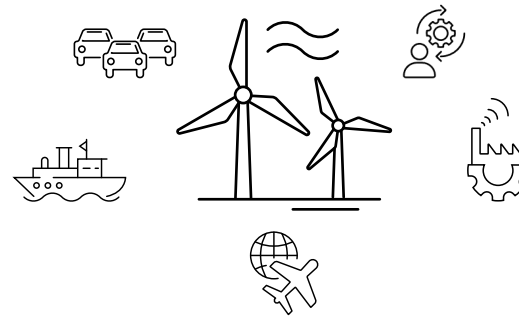
Event management



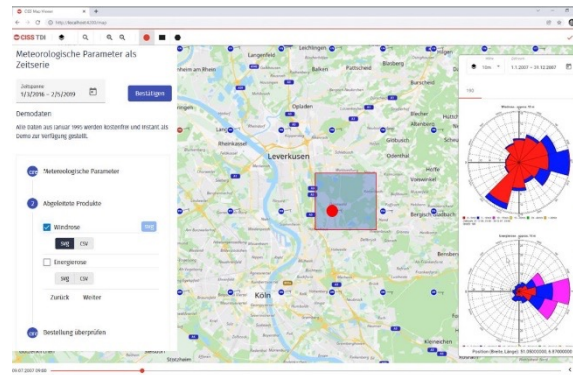
- Enriched weather information
- Weather-App



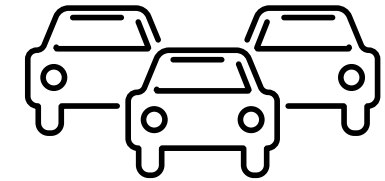
Energy industry



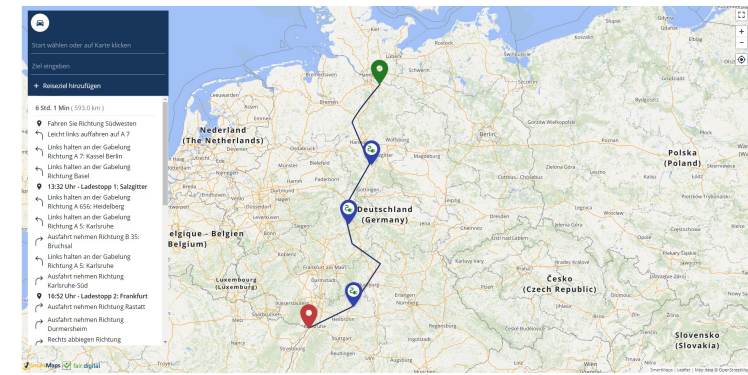
- **Enriched weather information**
- **FAIR-Portal**



Traffic



- Weather along route (SmartMaps)
- E-Range (API)





FAIR-Portal

Example: COSMO-REA6

Points of interest:

- Shopping cart
- Filtering
- Convert in formats
- Derived products
- Planned payment for services

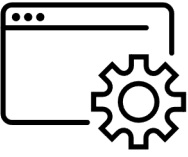
Specification of your data request

Preview of available data and products

The screenshot displays the 'FAIR-Portal' interface for the COSMO-REA6 dataset. The main area shows a map of the Cologne region with a red dot indicating a specific location. The sidebar on the left contains the following elements:

- Zeitspanne:** 1/3/2016 – 2/5/2019
- Demodaten:** Alle Daten aus Januar 1995 werden kostenfrei und Instant als Demo zur Verfügung gestellt.
- Filtering:** 'Windrose' is selected, and 'Energirose' is unselected.
- Format Selection:** 'SVG' and 'CSV' options are available for both 'Windrose' and 'Energirose'.
- Buttons:** 'Bestätigen', 'Zurück', 'Weiter', and 'Bestellung überprüfen'.

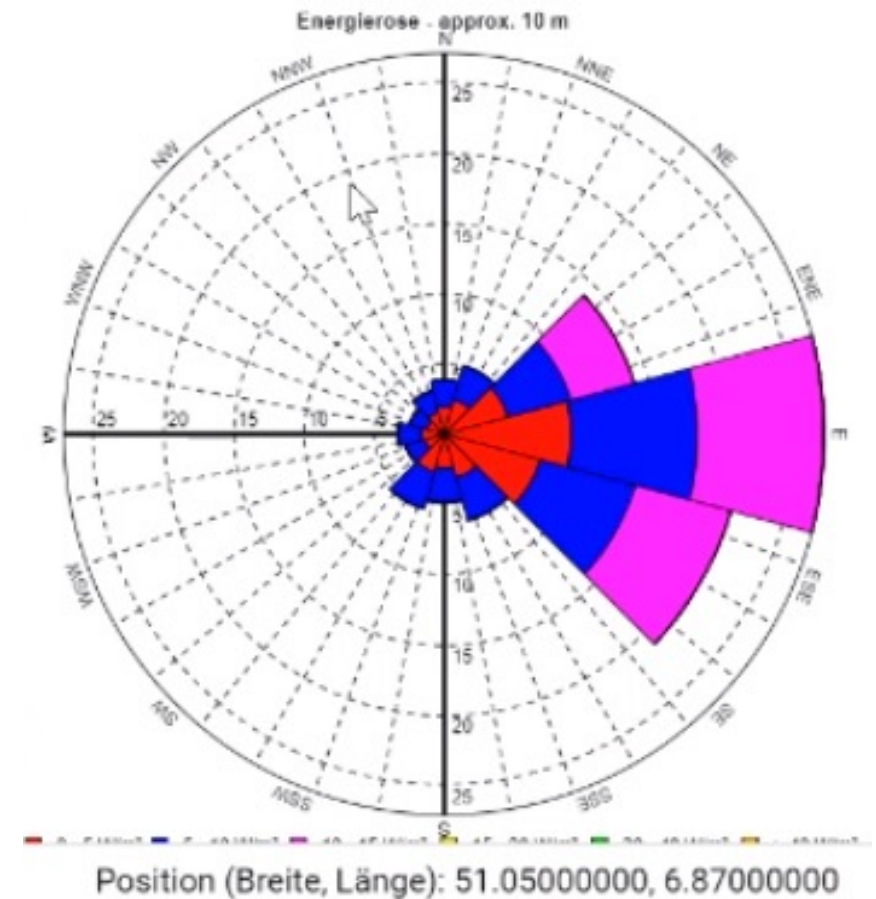
On the right side of the map, there are two circular wind rose charts. The top chart is titled 'Windrose - approx. 10 m' and the bottom chart is titled 'Energirose - approx. 10 m'. Both charts show wind direction and speed data for the specified location and time period.



Example: energy rose API

To generate an energy rose

- Visualization of the energy contained in the wind in W/m^2
- Delivery as vector graphic in SVG
- Delivery of the data in CSV





Integration into a GeoNetwork Catalog at <https://fair-metadata.de/geonetwork>

The screenshot displays the FAIR GeoNetwork catalogue interface. The main content area is titled "Regionale Reanalyse COSMO-REA6 (Sammlung)". It contains two paragraphs of text describing the dataset: 35 2D parameter fields and 5 3D parameter fields. A blue button labeled "Kontinuierliche Aktualisierung" is visible. Below the text is a "Downloads und Links" section with a link to the DWD opendata folder. A "Verlinkte Ressourcen" section lists a related dataset: "Regionale Reanalyse COSMO-REA6: monatliche Auflösung". On the right side, there is an "Überblick" section with a heatmap titled "10m-Windgeschwindigkeit für COSMO-REA6 am 18.01.07 um 16:00 UTC". Below the heatmap are sections for "Keine Bewertungen" and "Räumliche Ausdehnung" which lists "Deutschland". A map at the bottom right shows the geographical extent of the data over Germany and surrounding regions.

FAIR GeoNetwork catalogue

Suche Karte Anmelden Deutsch

Zurück < Zurück Nächster >

Herunterladen Anzeigemodus

Regionale Reanalyse COSMO-REA6 (Sammlung)

35 zweidimensionale Parameterfelder werden in stündlicher, täglicher und monatlicher Auflösung im originalen COSMO grib1 Format zur Verfügung gestellt wie z.B. Luftdruck, Niederschlag, Temperatur, Strahlungsparameter und Windkomponenten auf 10m und 100m Höhe. Windgeschwindigkeit und Windrichtung auf verschiedenen festen Höhen zwischen 40m und 200m über Grund werden ebenfalls in stündlicher, täglicher und monatlicher Auflösung, aber im netCDF Format, zur Verfügung gestellt. Eine genaue Auflistung der zwei- und dreidimensionalen Parameter kann hier gefunden werden:
https://opendata.dwd.de/climate_environment/REA/ParameterTabellen.pdf.

5 dreidimensionale Parameterfelder gibt es in stündlicher, täglicher, und monatlicher Auflösung für Temperatur, spezifische Feuchte, Windkomponenten, und turbulente kinetische Energie. Für die dreidimensionalen Felder werden die untersten 6 COSMO Modell-Level ausgegeben. Deren Höhen sind zeitlich unveränderlich, aber variieren mit der Topographie. Über dem Meer entsprechen die untersten 6 Modell-Level 10m, 35m, 69m, 116m, 178m und 258m Höhe. Konstante Parameter, wie z.B. die Höhe der Modell-Level, Höhe des Modellbodens, usw., sind in https://opendata.dwd.de/climate_environment/REA/COSMO_REA6/constant/ abgelegt. Hier sind auch die Zuordnungen der geografischen Längen und Breiten zum rotierten Längen-Breiten-Gitter von COSMO-REA6 zu finden.

Kontinuierliche Aktualisierung

Downloads und Links

DWD opendata Ordner für COSMO-REA6
https://opendata.dwd.de/climate_environment/REA/COSMO_REA6/ Link öffnen

Verlinkte Ressourcen

Regionale Reanalyse COSMO-REA6: monatliche Auflösung Kind-Datensatz

35 zweidimensionale Parameterfelder werden in monatlicher Auflösung im originalen COSMO grib1 Format zur Verfügung gestellt wie z.B. Luftdruck, Niederschlag, Temperatur, Strahlungsparameter und Windkomponenten auf 10m und 100m Höhe. Windgeschwindigkeit und Windrichtung auf verschiedenen

Überblick

10m-Windgeschwindigkeit für COSMO-REA6 am 18.01.07 um 16:00 UTC

Keine Bewertungen

Alle Bewertungen anzeigen

Fügen Sie Ihre Bewertung hinzu

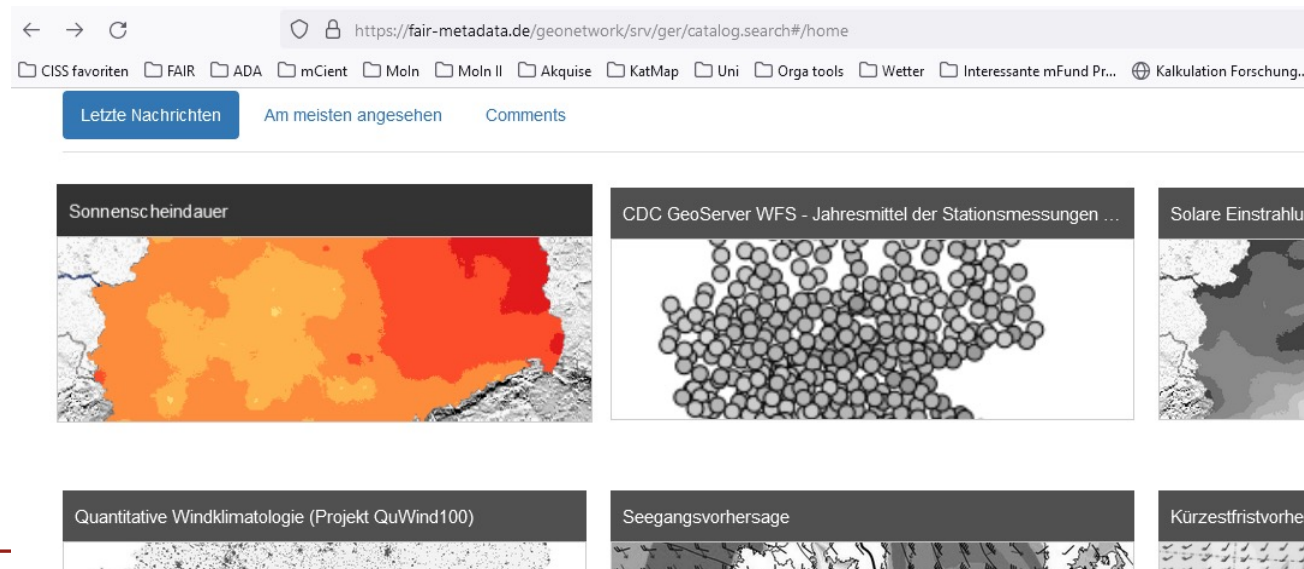
Räumliche Ausdehnung

- Deutschland

meta data service

For metadata-based search of meteorological data

- *Fast findability*
- *Clear data description*
- *Link to source and other submitting agencies (FAIR portal)*





summary



Summary in three points

1

Weather information is difficult to assess

2

FAIR makes weather data easy to assess

3

FAIR enriches raw data and provides easy-to-use formats



Architecture

