

solar decathlon 21 europe

WUPPERTAL GERMANY *...goes urban!*

urban
situations
defined

call for teams_ addendum a

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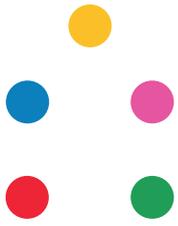
preface

As an addition to the Call for Teams, published on 29th of March 19, this document presents the three urban situations based on examples from Wuppertal's built environment. It gives an overview of the three situations and provides key information. After participating Teams are selected, detailed information on the buildings, such as floor plans, views, sections etc., will be published. In their submissions, applicants should describe / illustrate only a design intention which includes the focus of their energy concept. It is understood that the detailed development and implementation of the design and concepts will be carried out and completed by the Teams after selection as a participating Team. In combination with the urban situations, provided in the article on the www.sde21.eu webpage, Teams can start to plan. It is a ready-to-use package.

situations & options

Please note that Teams are free to propose one of the three urban situations as applied to their city of origin, or choose one of these situations specific to Wuppertal. In the case that a Team elects to apply a situation to their city of origin, they will need to provide similar information to make the circumstances and the approach visible for the jury.

Prospective Teams are invited to understand the three situations with their corresponding parametres and principles as these could be applied and contextualised into the Teams' choice city.



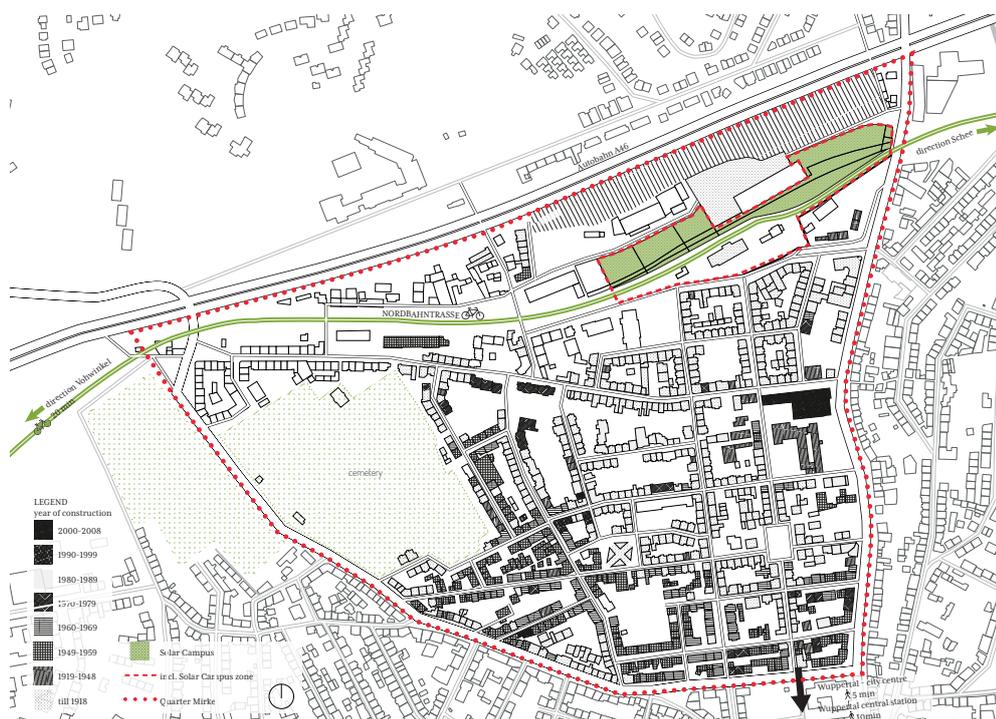
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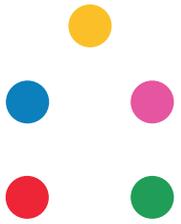
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a neighbourhood with potential

The Mirker Quarter is a central, mixed urban neighbourhood that has evolved over time. Characteristic for the Mirker Quarter as well as for Wuppertal is the hilly topography. The building stock, which comprises more than 800 buildings, largely consists of typical buildings from the end of the 19th century, mixed with post-war buildings from the 1950s and 1960s. This is representative for many urban neighbourhoods in Germany and throughout Europe. Some buildings are already renovated, others are in their original condition. The energy infrastructure consists of a natural gas and power grid of the local utility (<https://www.wsw-online.de/>). Existing buildings partly use solar systems or combined heat and power units. For more information about the energy classification of the existing building stock in Germany, see <http://webtool.building-typology.eu/>. Due to the damage after the Second World War and the resulting development of the city, numerous curious urban and architectural situations have developed. However, the quarter and neighbourhood has potential for urban densification and offers interesting and realistic planning tasks for the Solar Decathlon Europe 21 with great opportunities for multiplication. The district is well connected for pedestrians to the city centre. Private parking is very limited.

THE MIRKER QUARTER



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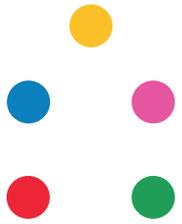
urban and architectural challenges towards climate neutrality

The further development of future cities towards climate neutrality is a central topic in Europe, see [Baukultur Report Heritage – Presence – Future 2018/19](#). Urban revitalisation, and the changing lifestyles of city dwellers, make innovative densification concepts and the adaptation of existing building stocks necessary. Against this background, and associated with the challenge of urban mobility, the SDE21 addresses three urban situations:

- 1. RENOVATION & EXTENSION**
- 2. CLOSING GAPS**
- 3. RENOVATION & ADDITION OF STOREY**

All three situations exist in the Mirke district, in Wuppertal. For those Teams proposing a comparable situation from their home town / country, documentation of the existing conditions must be provided.



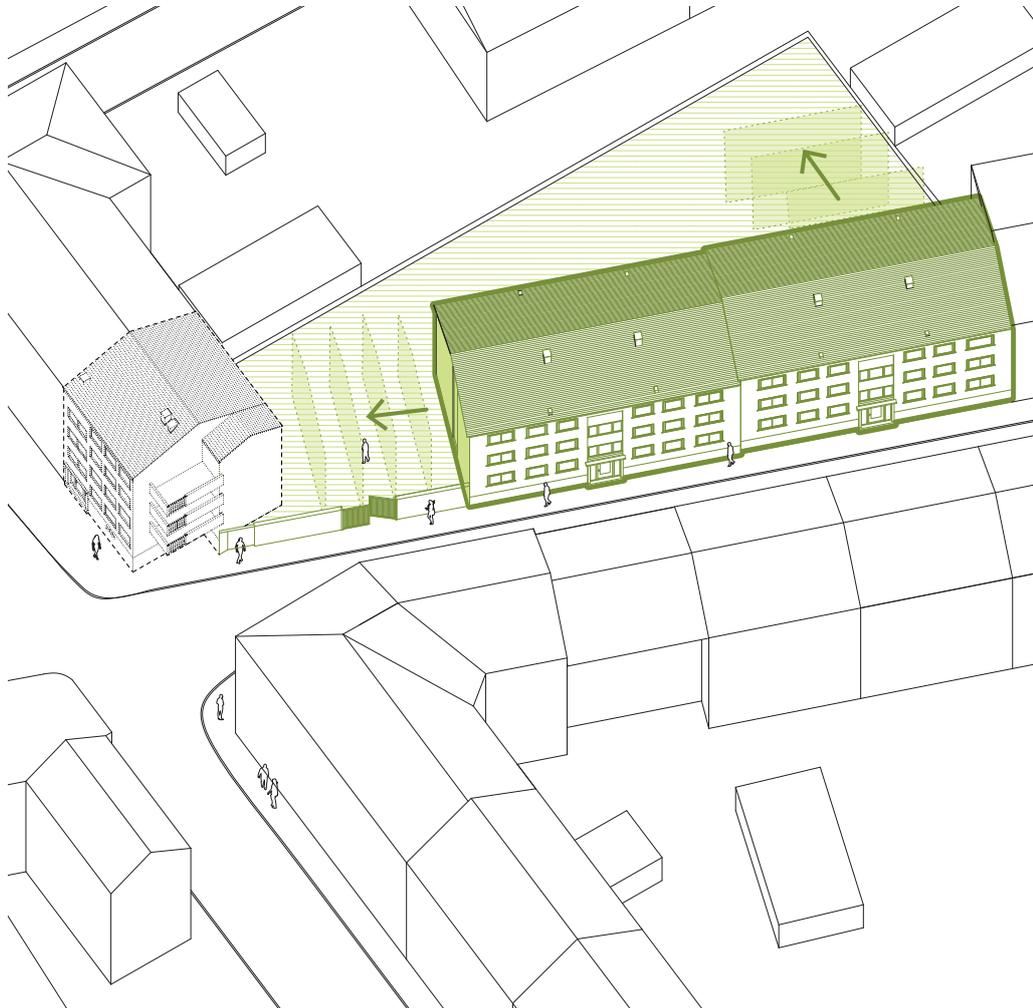


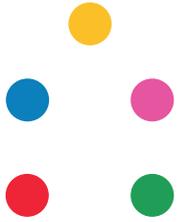
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I renovation & extension

Renovation is an important step towards the transitions of cities. Specifically, buildings constructed after the Second World War are no longer suitable for the city of tomorrow. Often constructed with inexpensive building materials, insufficient insulation and inflexible floor planning, these buildings present low-quality living for the city residents of tomorrow. The transformation of these buildings makes them attractive, integrating them into urban energy transition. The concept of inner courtyards in overall strategies may increase quality of life. The renovation may be combined with an extension of the existing building to create more living space and optimize space efficiency.

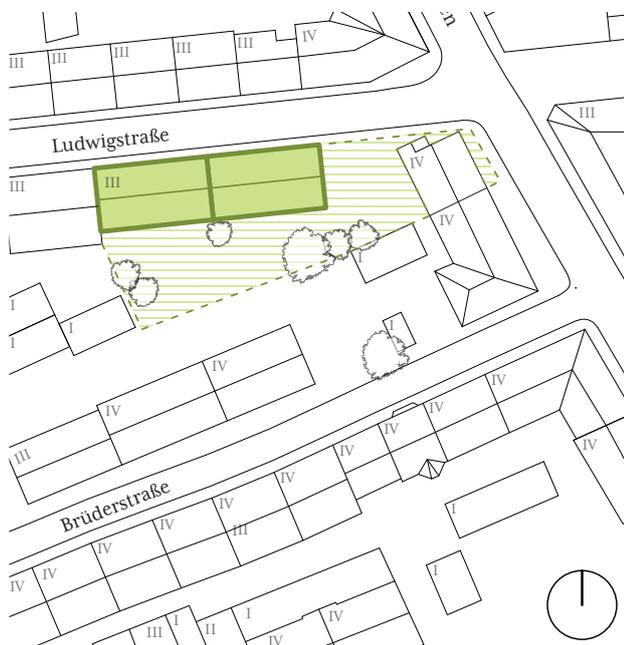




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I renovation & extension cont'd



More information about this building typology can be found at <http://webtool.building-typology.eu>, category DE.N.MFH.05.Gen

Construction area:	1100 sqm
Site concept area:	1100 sqm
Footprint:	360 sqm
Type of building:	Part of a destroyed and rebuilt perimeter development

TWIN BUILDINGS

Use:	2 Residential houses with each 6 residential units
Year of construction:	1970
Floors:	3 floors
Unit sizes:	between 60 and 80 sqm
Roof shape:	north-south oriented pitched roof
Ridge height:	11.50
Eaves height:	8.90
Floor height:	3m
Construction method:	solid structure
Type of facade:	punctuated façade
Energy supply:	natural gas and power grid

DESIGN DEVELOPMENT

Neighboring development:

Heterogeneous residential development around 1970.

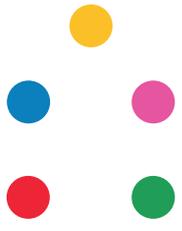
Building situation:

One of the two twin buildings is to be transformed and extended. An extension is possible either to close the perimeter development or to the inner courtyard. This depends on which building the Team will focus on; see Axonometry. The head building is available for planning, i.e. it can be included in the planning, but does not have to be. It can also be demolished.

Site concept:

The inner courtyard, which is currently used as a parking lot for the residents, is available for the development of a superordinate site concept. If the head building is considered in the planning, it can be included in the site concept as well.

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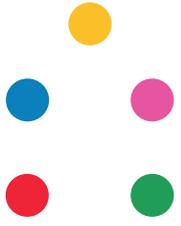


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I renovation & extension cont'd



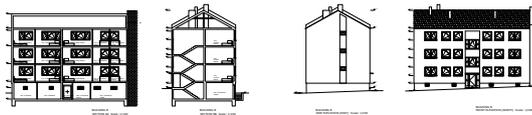
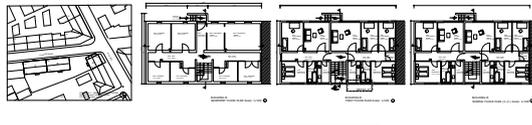


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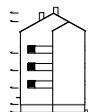
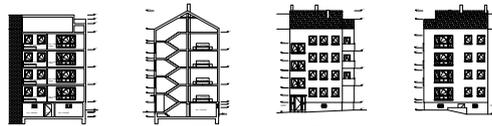
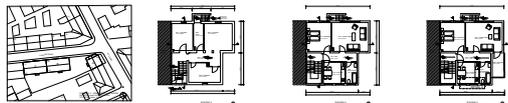
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I renovation & extension cont'd

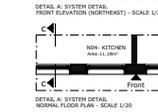
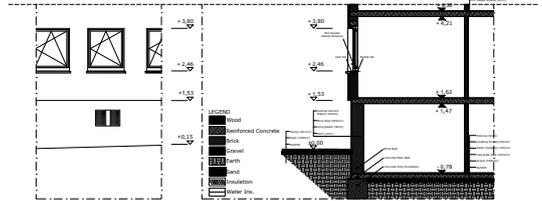
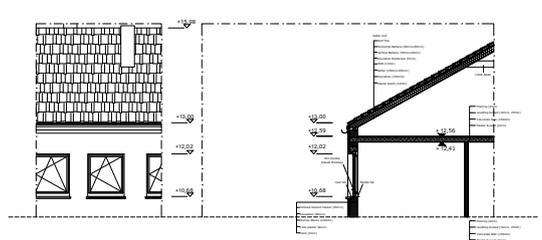
SITUATION 1 - RENOVATION & EXTENSION
LUDWIGSTRASSE 69



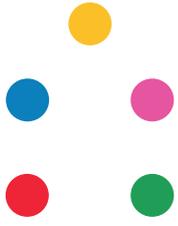
SITUATION 1 - RENOVATION & EXTENSION
HÖCHSTEN 28



SITUATION 1 - RENOVATION & EXTENSION
HÖCHSTEN 28



Additional material can be downloaded at [this link](#).



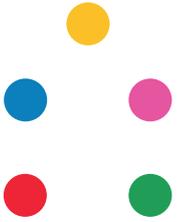
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2 closing gaps

Within the city, undeveloped areas surrounded by two or more buildings are designated as vacant lots. Closing these gaps is a favourable possibility to increase urban density. In parallel, innovative architectural and energy supply solutions for these gaps can repair the cityscape and inspire an entire neighbourhood including its energy supply.





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2 closing gaps cont'd



Construction area:	230 sqm	
Site concept area:	3800 sqm	
Average footprint:	110 sqm	
Type of gap:	Closure of a peripheral development	

ORIGINAL BUILDING

Use:	Residential house with apx. 5 residential units
Year of construction:	1918, demolished 2017/18
Floors:	4 floors
Roof shape:	east-west orientated pitched roof
Ridge height:	right neighbour 20 m left neighbour 19.56m
Eaves height:	left neighbour 15.4 m right neighbour 14 m
Floor height:	right neighbour 3.5 m left neighbour 3.85 m
Energy supply:	natural gas and power grid

DESIGN DEVELOPMENT

Neighboring development:

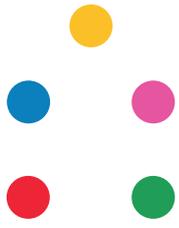
To the right and left of the gap there are 4-storey residential buildings with east-west oriented pitched roofs, partly with small salesrooms on the ground floor. To the east, the site borders on a cemetery.

Building situation:

This is a typical urban gap. The neighbouring development closes with fire walls. The planning task is to fill the gap in the construction site taking into account the direct neighbours.

Site concept: Three neighbouring buildings to the left and right of the gap and the open space on the opposite side of the street are available for the development of an overarching site concept. Currently, the open space is a public green area with a playground and a football field.

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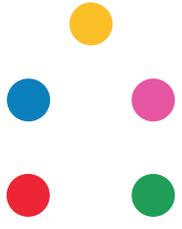


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2 closing gaps cont'd

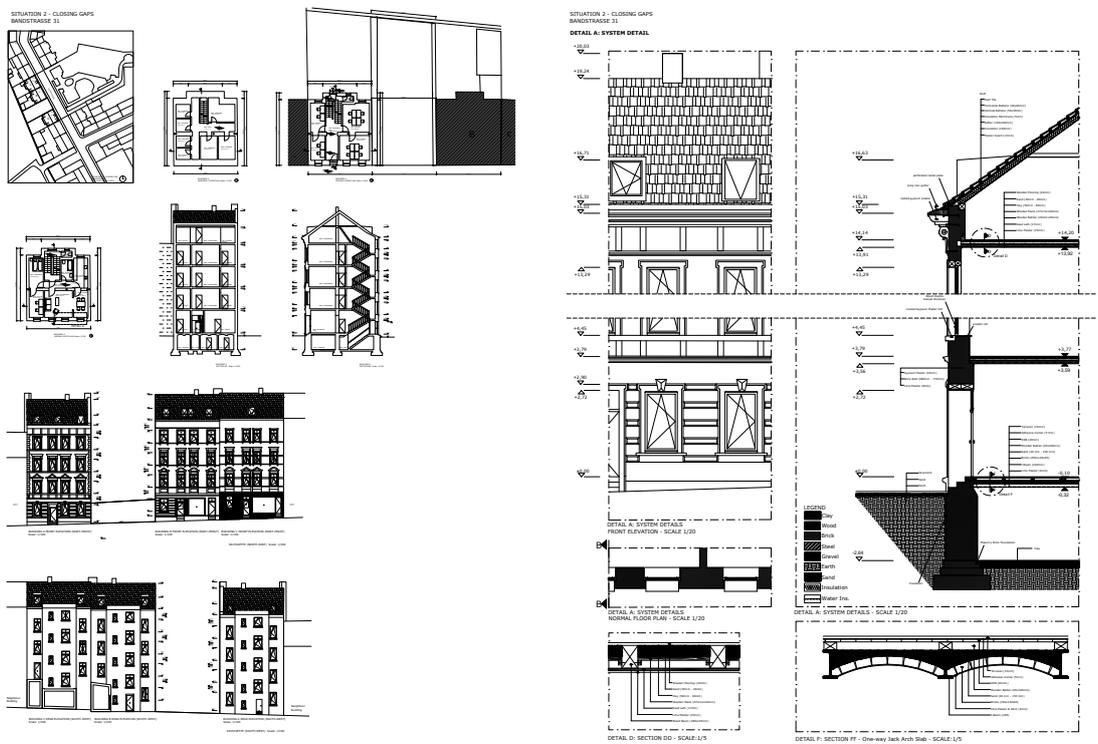




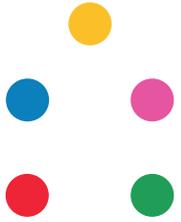
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2 closing gaps cont'd



Additional material can be downloaded at [this link](#).



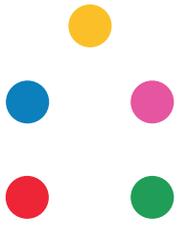
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3 renovation & addition of storey

The addition of one or more extra storeys to an existing building, including the renovation of an entire building, is a great opportunity for the proposal of new design ideas and the creation of alternative living spaces, thus sustainably increasing urban density. The addition of storeys is often found in residential and office buildings. In urban areas, warehouses and old factory buildings are also being extended more and more frequently. The diversity of use revives the urban space. Roof top extensions create a platform for intensive solar energy utilization.





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3 renovation & addition of storey cont'd



Construction area:	456 sqm	
Site concept area:	2500 sqm	
Footprint:	456 sqm	
Type of building:	Solitaire with industrial character	

ORIGINAL BUILDING:

Use: floor, upstairs event location
for e.g. dance courses

Year of construction: around 1905

Floors: 2 floors

Roof shape: sawtooth roof

Floor height: 3,5 m first floor
3 m second floor

Construction method: column grid

Type of facade: punctuated façade

Year and type of last

renovation: completely renovated in 2006

Energy supply: natural gas and power grid

DESIGN DEVELOPMENT

Neighboring development:

The neighbouring development is very heterogeneous. In the east there is an intact perimeter development with housing, built around 1918; in the south and north, newer residential buildings from 1980 are situated.

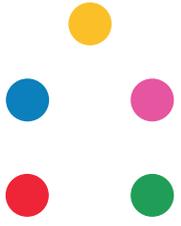
Building situation:

The purpose is to create additional living space by adding storeys. The café-restaurant enjoys great popularity in the neighbourhood and should remain on the ground floor.

Site concept:

The site north of the object is available for the development of a superordinate site concept. Currently there is a separate area where the terrace of the café-restaurant is located. The eastern area is used as a parking lot.

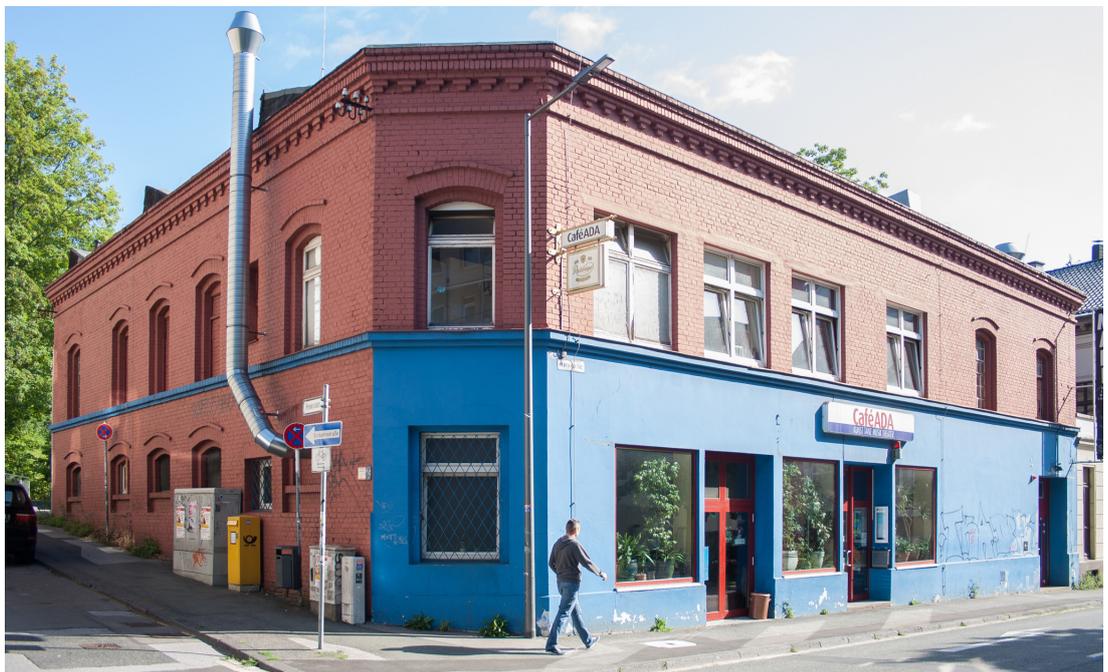
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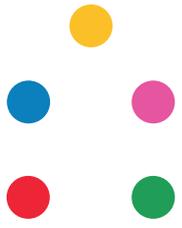


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3 renovation & addition of storey cont'd

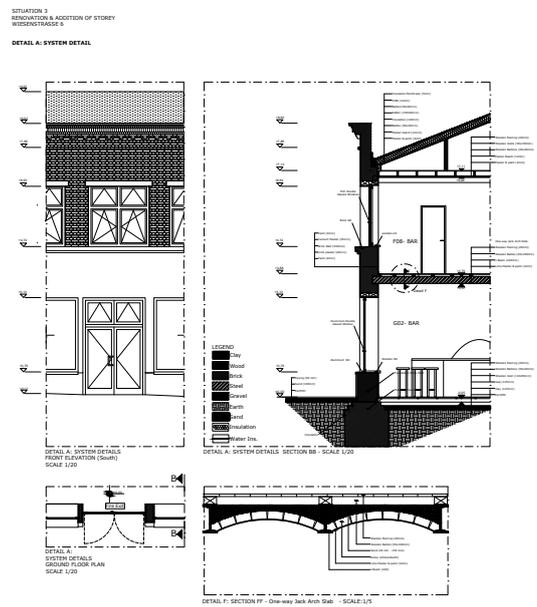
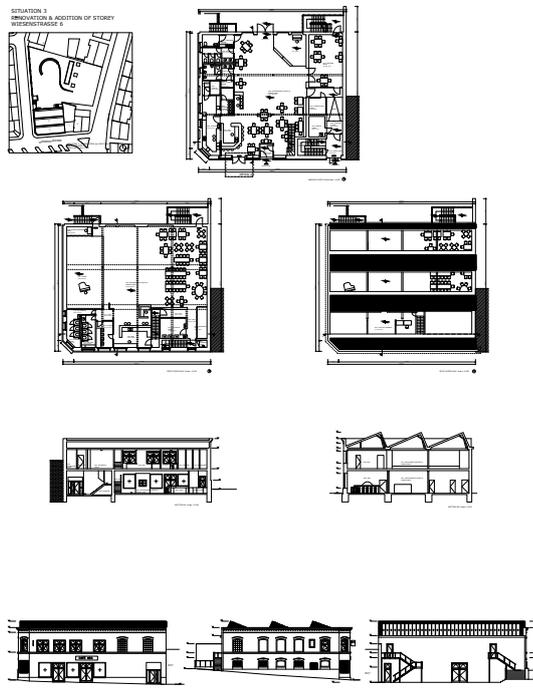




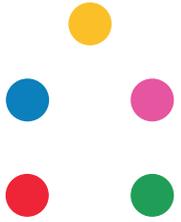
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3 renovation & addition of storey cont'd



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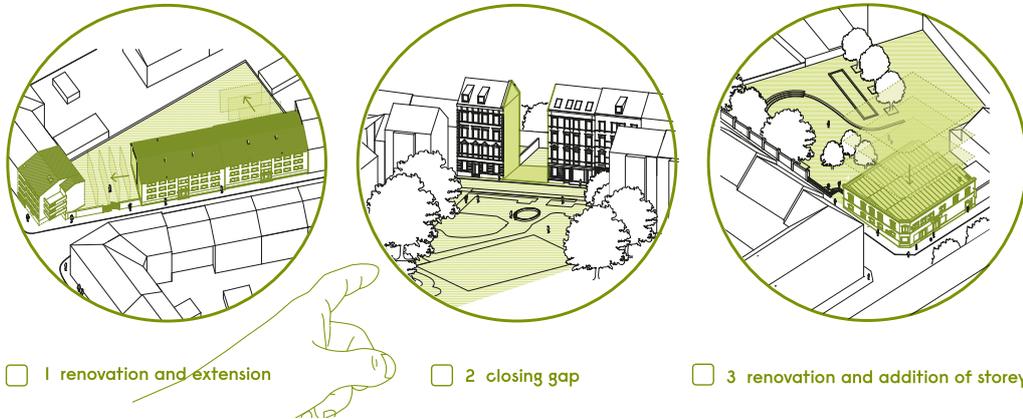


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choose one urban situation



handle both challenges

As described in the Call for Teams, the whole project splits up into a design challenge for the whole building project and the challenge to build and operate a Demonstration Unit (similar to SDE units from past competitions).

Building design challenge

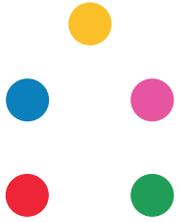
The requirements for the building designs are similar to an architectural design competition. A design and energy concept for the whole building needs to be developed following the idea of carbon neutrality.
Scale: 1:500 site plan, 1:100 ground plans, sections and elevations, up to 1:5 for architectural details

A continuing part of the building design is the **site concept**: Besides the building design task, the surrounding neighbourhood is described. On a conceptual level, it offers the possibility to address neighbourhood solutions such as open space design, shared spaces, energy networks, urban mobility solutions etc. *Scale: no scale defined, conceptual level only*

Demonstration Unit

The Demonstration Unit is part of the completely designed building. The Teams are free to choose the most representative part of their building design, but solar systems have to be integrated.
Scale in planning phase 1:50 up to 1:2 for architectural details, build in scale 1:1.

Inspiring built examples from past Solar Decathlon competitions can be found at: <https://building-competition.org/>. More information is available after registration.

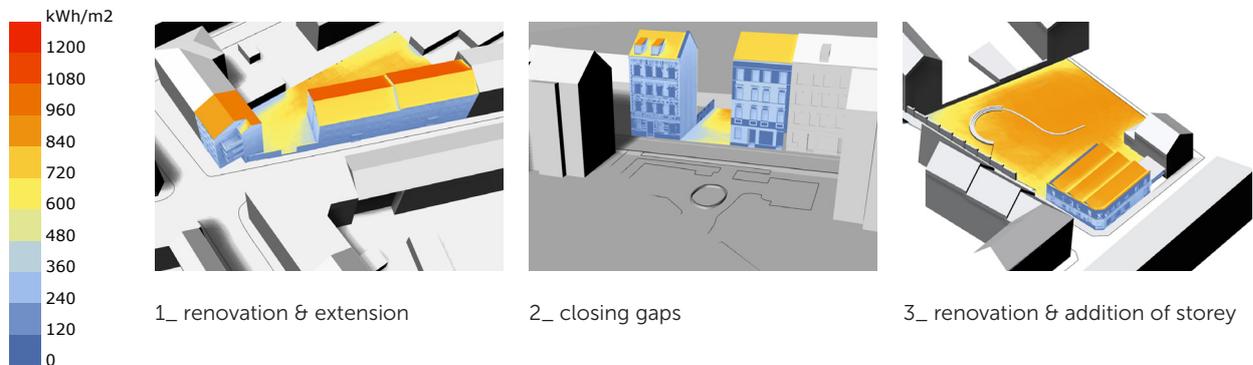


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solar potentials

The following simulations show the solar irradiation per year on the three presented situations.



wuppertal weather data

The climate in Wuppertal is temperate. According to the Köppen climate classification, Wuppertal is included in main group C (temperate) and sub-group Cfb (Temperate oceanic climate) based on precipitations and temperature patterns. This climate type has coldest months averaging above 0 °C (or -3 °C), all months with average temperatures below 22 °C, and at least four months averaging above 10 °C. Also, for the precipitation there is no significant difference between seasons¹. To represent the climate pattern of Wuppertal, Energy Plus™ Weather (EPW) file² belonging to Dusseldorf is used, for Dusseldorf is the nearest city to Wuppertal. Figures for the climate data are created using Ladybug™³ environmental analysis plugin for Grasshopper™⁴ in Rhinoceros™⁵.

Based on weather data, it is seen that average temperatures for the winter period is not lower than 2°C and average temperature for the summer period is not higher than 20 °C. The average annual temperature is 10.5°C (See Figure 1).

¹World Maps of Köppen-Geiger Climate Classification (<http://koeppen-geiger.vu-wien.ac.at/present.htm>)

²Energy Plus Weather Data (<https://energyplus.net/weather>)

³Sadeghipour Roudsari, Mostapha; Pak, Michelle, 2013. Ladybug: a parametric environmental plugin for grasshopper to help designers create an environmentally conscious design. In: Proceedings of the 13th International IBPSA Conference Held in Lyon, France Aug 25–30th.

⁴Grasshopper (<https://www.grasshopper3d.com/>)

⁵Rhinoceros (<https://www.rhino3d.com/>)



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wuppertal weather data, cont'd

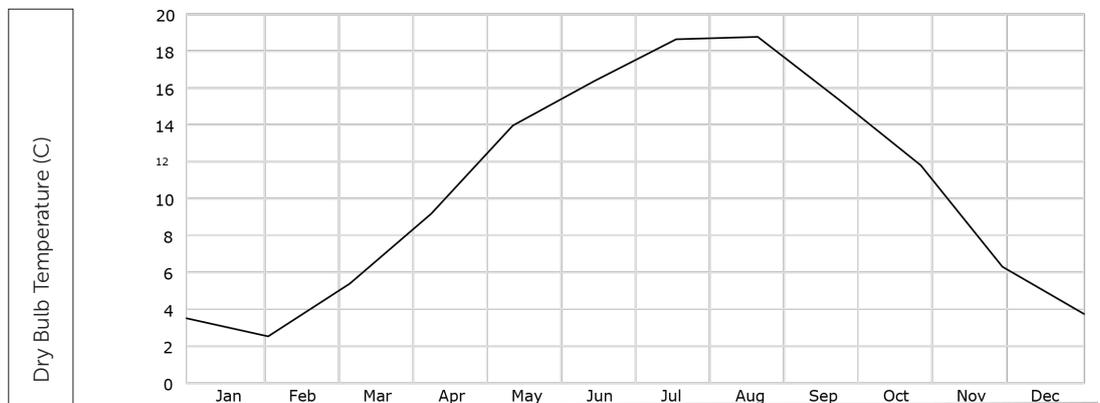


Figure 1: AVERAGE DRY BULB TEMPERATURE (°C)
Based on weather file for DEU_Dusseldorf.104000_IWEC.epw

Also, it is a city with considerable precipitation. Even in the driest month, rain falls are usual; the average annual precipitation of 1170 mm corresponds to the mean of 1986-2005; as mentioned, there is no significant difference between seasons. The lowest total precipitation value of 66 mm is seen in May while the highest total of 137 mm is seen in December and November (See Figure 2).

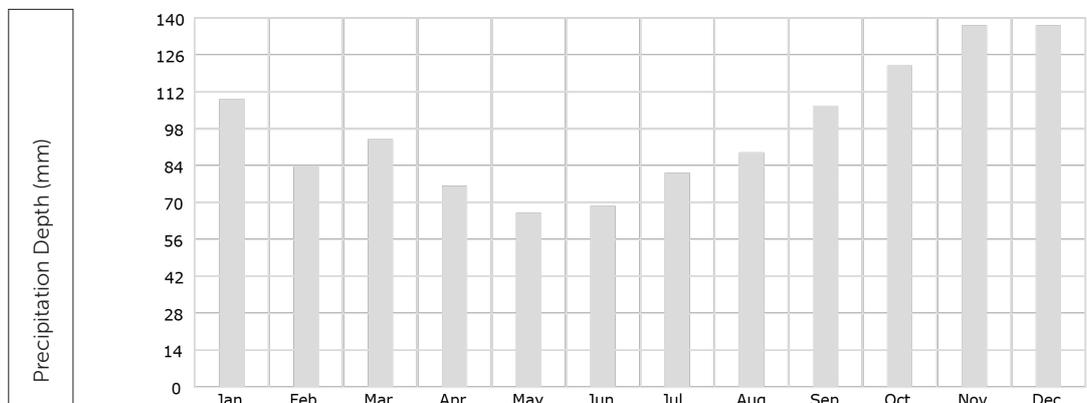


Figure 2: PRECIPITATION DEPTH
Mean of 1986 - 2005
Based on weather file for DEU_Dusseldorf.104000_IWEC.epw



wuppertal weather data, cont`d

Average relative humidity is 75%. Lowest value is % 66 in April and the highest value is 86% in December (See Figure 3). In order to understand the thermal perception in that area, it is important to consider the high relative humidity.

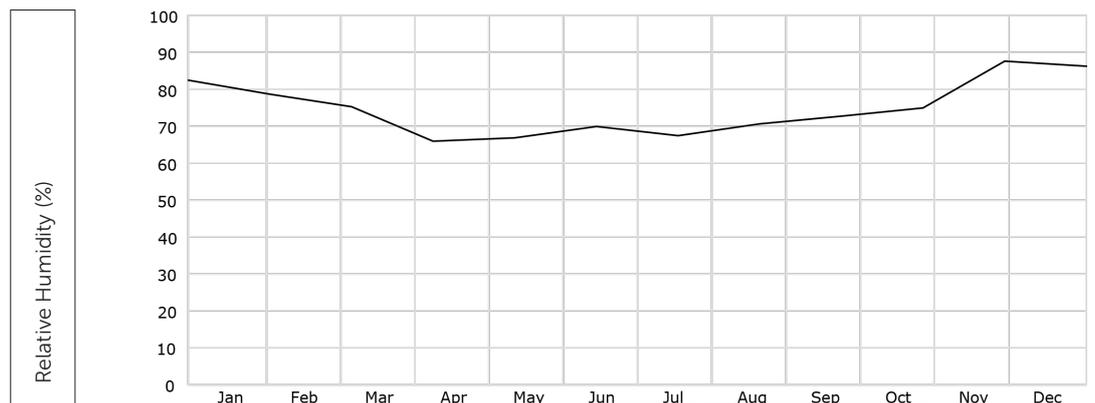
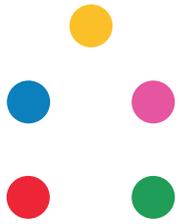


Figure 3: AVERAGE RELATIVE HUMIDITY (%)

Based on weather file for DEU_Dusseldorf.104000_IWEC.epw

The solar radiation is highest from April to August. Annual total amount of direct and diffuse horizontal radiation received on a surface is 942 kWh/m². Lowest monthly total value is 14.5 kWh/m² in December and the highest monthly total values are 143 kWh/m² and 144 kWh/m² in May and July (See Figure 4). Top views of a hemispherical matrix showing distribution and magnitude of total annual radiation from the areas of the sky dome can be seen below. (See Figure 5). Total annual radiation of the sky dome areas range between 16 kWh/m² and 40 kWh/m² in southern directions.



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wuppertal weather data, cont'd

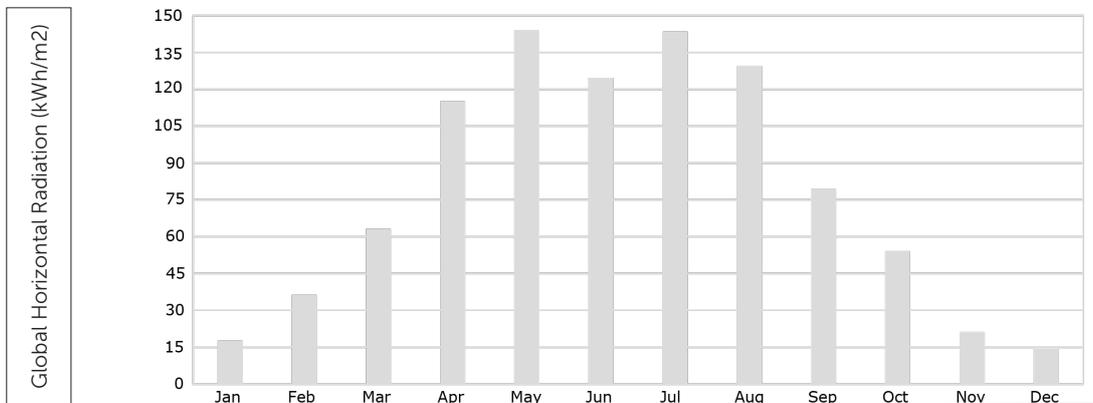


Figure 4: TOTAL GLOBAL HORIZONTAL RADIATION
(Total amount of diffuse and direct radiation received on a surface) in kWh/m²
Based on weather file for DEU_Dusseldorf.104000_IWEC.epw

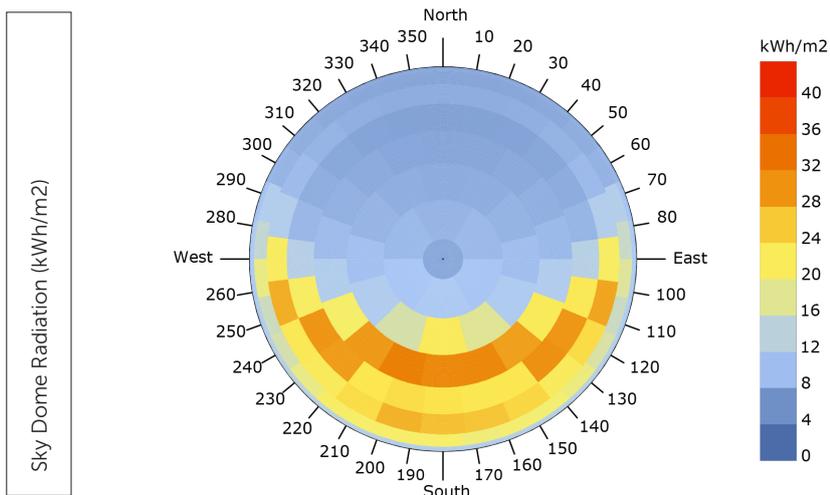
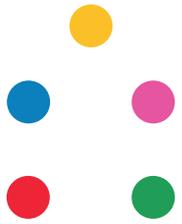


Figure 5: Top view of hemispherical sky matrix showing distribution and magnitude of total annual radiation (direct and diffuse) in kWh/m²
Based on weather file for DEU_Dusseldorf.104000_IWEC.epw

Noon time horizontal global illuminance reaches up to 10000 lux in summer and decreases to around 2000 lux in Winter (See Figure 6).



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wuppertal weather data, cont'd

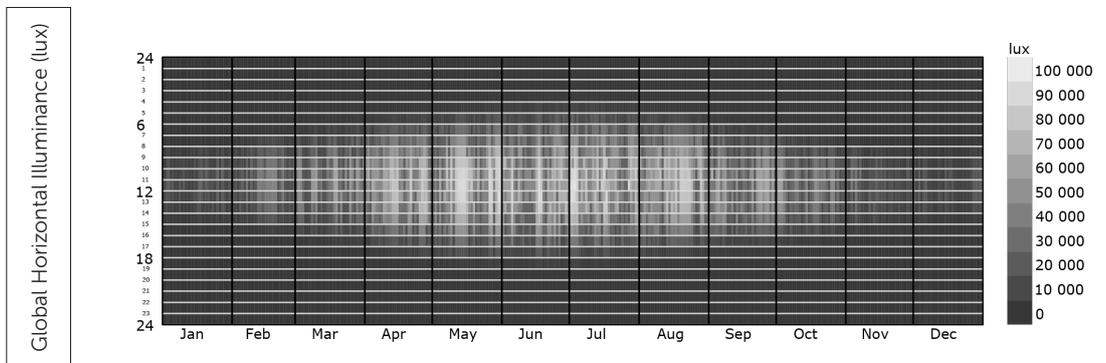


Figure 6: Global Horizontal Illuminance (lux) ___ Hourly JAN 1:00 - 31 DEC 24:00
Based on weather file for DEU_Duesseldorf.104000_IWEC.epw

Wind speed data from the epw data set for Duesseldorf should be considered for orientation only. Wuppertal and its district Mirke are located in a valley with significantly different wind speeds compared to the meteorological station at Duesseldorf airport. In general, wind speeds are significantly lower. The average hourly wind speed for the Duesseldorf data set reveals some seasonal variation over the course of the year (See Figure7). Average wind speed is around 4 m/s throughout the year. The windiest period (September to end March) has wind speeds of more than 4.5 m/s; the windiest month of the year is January with an average hourly wind speed of 6.5 m/s (See Figure 8).

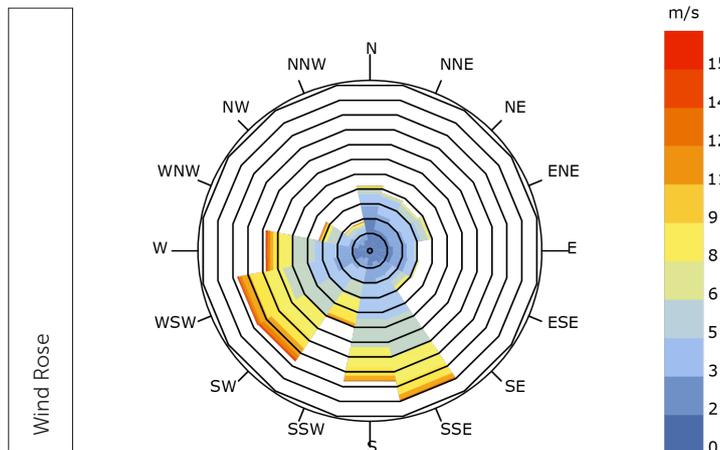


Figure 7: Wind-Rose DUSSELDORF_DEU1 JAN 1:00 - 31 DEC 24:00 Hourly Data: Wind Speed (m/s)
Calm for 3.13% of the time = 274 hours.
Each closed polyline shows frequency of 1.2%. = 107 hours.
Based on weather file for DEU_Duesseldorf.104000_IWEC.epw



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wuppertal weather data, cont'd

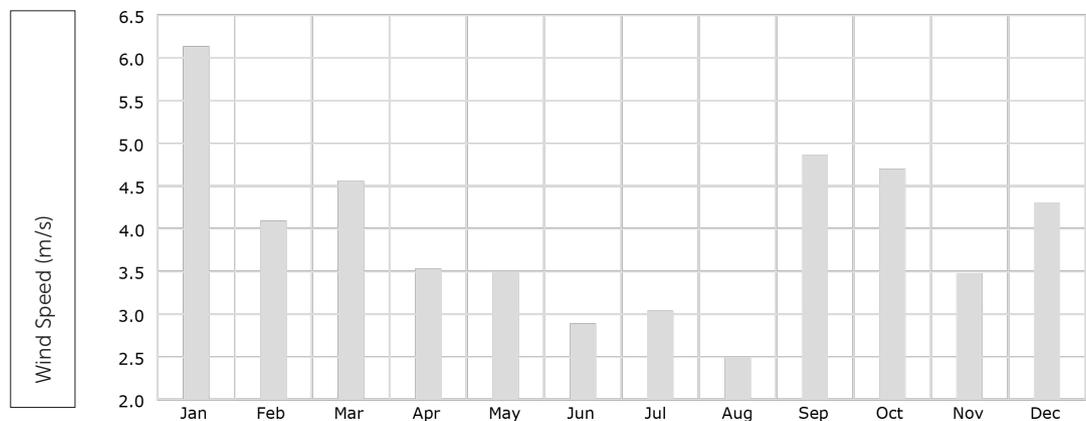


Figure 8: Monthly Average Wind Speed

Based on weather file for DEU_Dusseldorf.104000_IWEC.epw

IMPORTANT REMARK

Please note that the epw data sets are based on regional historical data (climate change effects are only partly included) and urban microclimate aspects are not taken into account. The German Federal Weather Service DWD has 2017 updated the set of German reference years with hourly resolution.

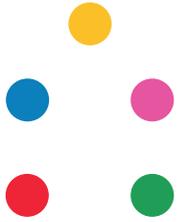
This included:

- recent data sets of the period 1995-2012,
- modelling of urban heat island effects and
- prediction of future weather data.

Data sets are free available here (German language information only):

<https://www.bbsr.bund.de/BBSR/DE/FP/ZB/Auftragsforschung/5EnergieKlimaBauen/2013/testreferenzjahre/01-start.html?nn=436654¬First=true&docId=1595620>

Teams may use these additional resources for simulation activities.



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WUPPERTAL GERMANY *...goes urban!*

mobility in the mirker quarter – status analysis

The Mirke quarter is located in the northern part of the centre of Wuppertal-Elberfeld and is accessible via the main roads Uellendahler Strasse and Gathe in the east, and Karlstrasse and Hochstrasse in the south and southwest. In the north of the quarter lies the federal motorway 46, which crosses the urban area of Wuppertal from east to west, mostly in an elevated position, and which has a major impact on the urban development of Wuppertal's northern part as a whole and contributes to the environmental pollution caused by noise and exhaust gases. Parallel to the motorway, also as a northern boundary, the new combined bicycle fast track and footpath “Nordbahntrasse” leads along a former railway line. It connects the quarter with the neighbouring districts.

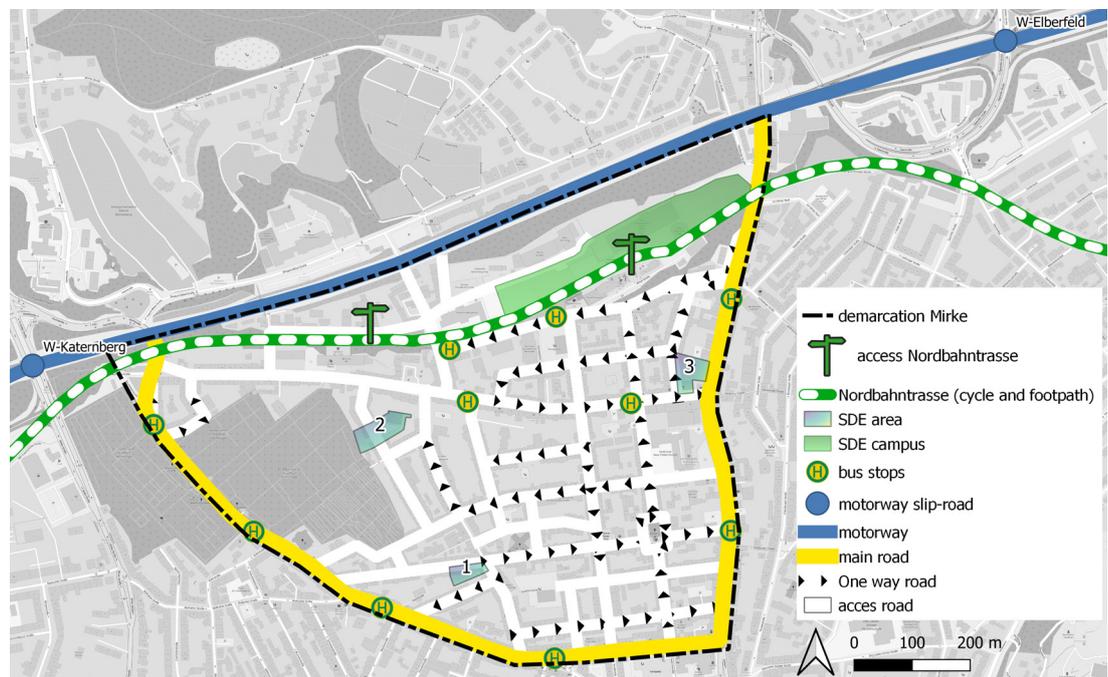
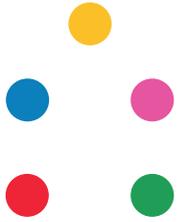


Figure 9: Network structure of the Mirker quarter and traffic connections to main roads, the Federal Motorway 46, and the Nordbahntrasse (map basis: OpenStreetMap)

Within the neighbourhood, the road network is structured as a grid network with regard to the geometry and consists mainly of collection roads and residential and living roads with a decisive development function. The basic form of the net elements used consists mainly of “hanging streets” (these “are net elements which are connected to other streets at both ends of meshed nets”⁶) - many of them in the installation traffic. The advantage of hanging streets is their high permeability, but they also regularly lead to unwanted creeping traffic.⁷



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mobility in the mirker quarter – status analysis cont'd

In the northern part of the quarter there are several commercial areas and several important traffic-generating facilities, such as the cultural centre “Bahnhof Mirke”, four kindergartens, a primary school, two secondary schools, the multicultural meeting centre “Alte Feuerwache”, three churches, eight playgrounds and sports grounds and various sports facilities. Within the neighbourhood there are small shops with a very limited range of goods. The nearest major shopping facilities are located approx. 800 metres from the centre of the quarter on Hochstrasse 54 and in the “Rathausgalerie” (Klotzbahn 5).

PEDESTRIAN AND BICYCLE TRAFFIC

The topography of the Mirker Quartier is demanding for pedestrians and cyclists. Road gradients of up to 10% (as on Neue Friedrichstrasse between house numbers 43 and 61) (see Figure 10) are not unusual. There are many sections that cannot be reached without barriers; for example, pavements are not lowered or parked vehicles and rubbish bins block the pavements.



Figure 10: Narrow paths and inclines (Photo: Olivia Spiker)

⁶Steierwald, Gerd; Kühne, Hans Dieter (Eds.) (2005): Stadtverkehrsplanung – Grundlagen, Methoden, Ziele, Berlin Heidelberg, p. 486

⁷cf. *ibid.*, pp. 486-489

mobility in the mirker quarter – status analysis cont'd

The reactivation of the former railway line “Nordbahntrasse” in 2014 created a 23-kilometre⁸ footpath and cycle path with a very low gradient connecting eastern and western districts of the “band town” of Wuppertal. This route is currently the longest cycle fast track in Germany. It has led to a rethinking in traffic planning practice away from the guiding principle of the “car-friendly city” towards the guiding objective “Wuppertal as a bicycle city”⁹. With the northern railway line and other new cycle connections have also induced a rethinking in the population, and many road users have an alternative to the car. In the north of the quarter there is the one-kilometre section of the Nordbahntrasse with access roads at Dorrenberg and Mirke railway station (“Bahnhof Mirke”).

Figure 11 shows some other elements of the environmental network in addition to the Nordbahntrasse, which are important for pedestrian and bicycle traffic: access routes to the Nordbahntrasse, two car sharing stations, charging stations for electric vehicles, bicycle rental companies, bicycle parking facilities, planned bicycle routes and staircases.

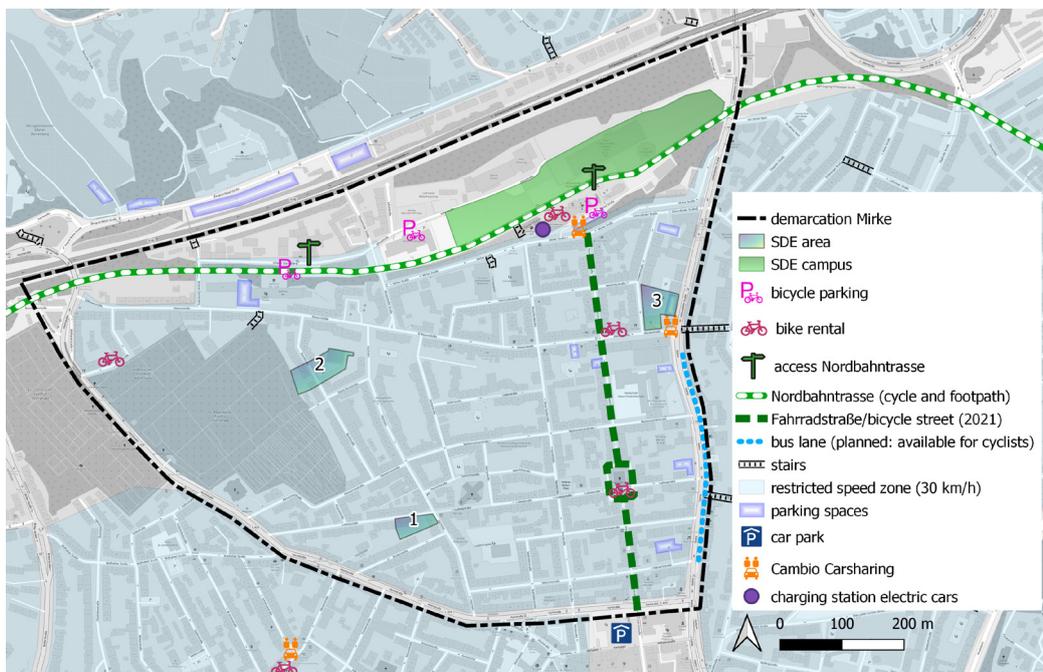
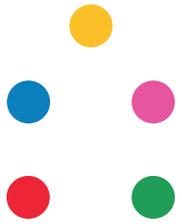


Figure 11: Inventory of pedestrian and bicycle traffic (map basis: OpenStreetMap)

⁸ <https://www.wuppertalbewegung.de/nordbahntrasse/streckenverlauf/>, retrieved November 06, 2019

⁹ <https://www.wuppertal.de/microsite/wuppertal2025/fahrradstadt/fahrradstadt.php>,

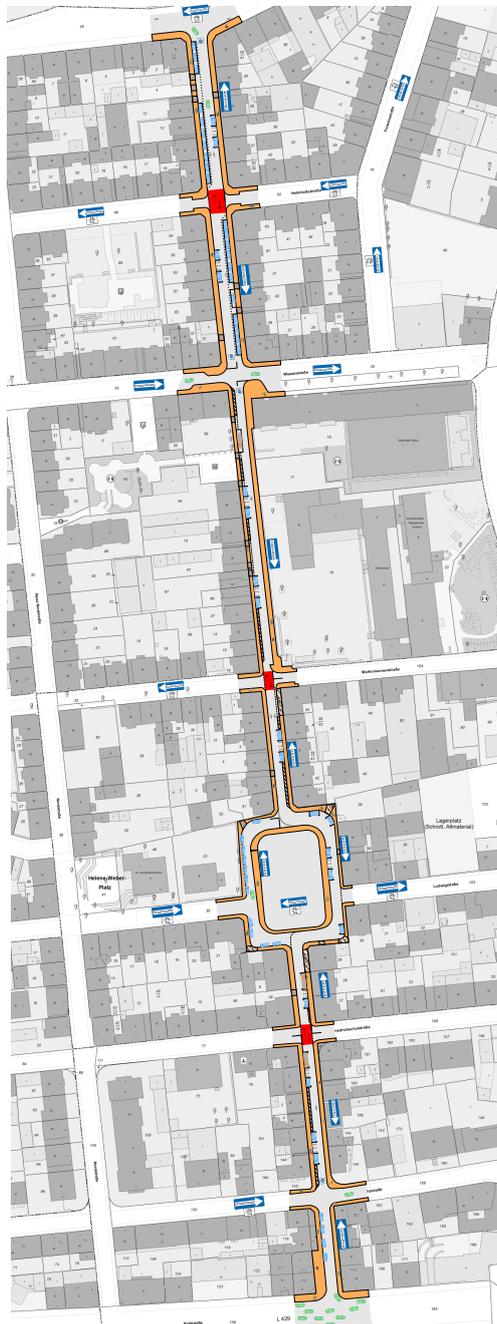
retrieved November 06, 2019



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mobility in the mirker quarter – status analysis cont'd



Some one-way streets will be “reversed” in the course of the planned construction of a bicycle street on the Neue Friedrichstrasse in 2021. The aim is to make the Neue Friedrichstrasse a transit connection as unattractive as possible for the motorised individual transport so that it will become as attractive as possible for cycling.

Figure 12: Redesign of the one-way street system at Neue Friedrichstrasse by 2021

Source: City of Wuppertal Department of Surveying, Cadastral Office and Geodata (Ed.) (2019):

Overview Plan



mobility in the mirker quarter – status analysis cont'd

The city of Wuppertal's medium-term goal is to create a complete cycle connection between the cultural centre "Bahnhof Mirker" and the main railway station of Wuppertal by means of express cycle routes and cycle lanes on the other roads. The planning envisages a bicycle route for the Neue Friedrichstrasse between Albrechtstrasse and Mirker Strasse, which is to be implemented by spring 2021 using markings and signage. In this section, around 50 out of 100 car parking spaces will be eliminated.¹⁰ On the one hand, this may further increase the existing parking pressure in the short term, but on the other hand it will act as a so-called "push measure" in the long term. This will help to reduce motorised individual transport¹¹ and achieve a shift away from car traffic and towards the means of environmentally-coordinated intermodal transport.

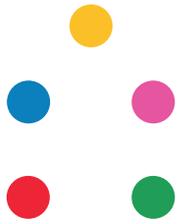
Furthermore, the city of Wuppertal has recently decided that the bus lane on the Gathe will be opened for cycling. This is to be implemented in the winter of 2019 by changing the signage¹² (see Figure 11).

As part of Wuppertal's climate protection project "Short Ways for Climate Protection"¹, the range of car sharing services and bicycle rental are to be expanded. Six pedelecs and six cargo bikes were purchased, which are available for free rental. The bicycle rental is done by volunteers. The bikes can be selected and booked via a booking platform (<https://fienchen-wuppertal.de/>) and the twelve rental stations located in the Nordstadt can be found. So far there are four rental stations in the quarter Mirke: Utopiastadt (cargo bike "Fienchen"), "Initiative Kreuzkirche e. V.", (cargo bike "E-mil"), Supercargo (cargo bike "E-mil"), "Klimaschutzsiedlung Malerstrasse" (Pedelec "Pina") (see Figure 12).

¹⁰ Verbal source from the City of Wuppertal, Ressort Strassen und Verkehr 104.54 Nahmobilität, retrieved November 07, 2019

¹¹ Cf. Umweltbundesamt (Ed.) (2012): Achieving sustainability in urban transport in developing and transition countries, Dessau-Roßlau, p. 9: <https://www.umweltbundesamt.de/publikationen/achieving-sustainability-in-urban-transport-in>, retrieved November 19, 2019

¹² Verbal source from the City of Wuppertal, Ressort Straßen und Verkehr 104.54 Nahmobilität, retrieved November 07, 2019



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PUBLIC TRANSPORT

There are a total of 17 bus stops in the quarter, four of which are on one-way streets. Twelve bus stops are located at important junctions on Uellendahler Strasse/Gathe and Hochstrasse. At the Uellendahler Strasse/Gathe there are five bus lines that run every twenty minutes during peak hours, as well as additional vehicles that run at peak hours or at night. Due to partly overlapping line programme and scheduling, it is possible to depart every six minutes from the Schleswiger Strasse stop to the Wuppertal main station or to the Döppersberg “Schwebebahn” railway stop on weekdays during rush hours. A similar situation of accessibility can be found at the Hochstrasse/ Karlstrasse, but through four bus lines only. Bus line 620 crosses the quarter with five bus stops.

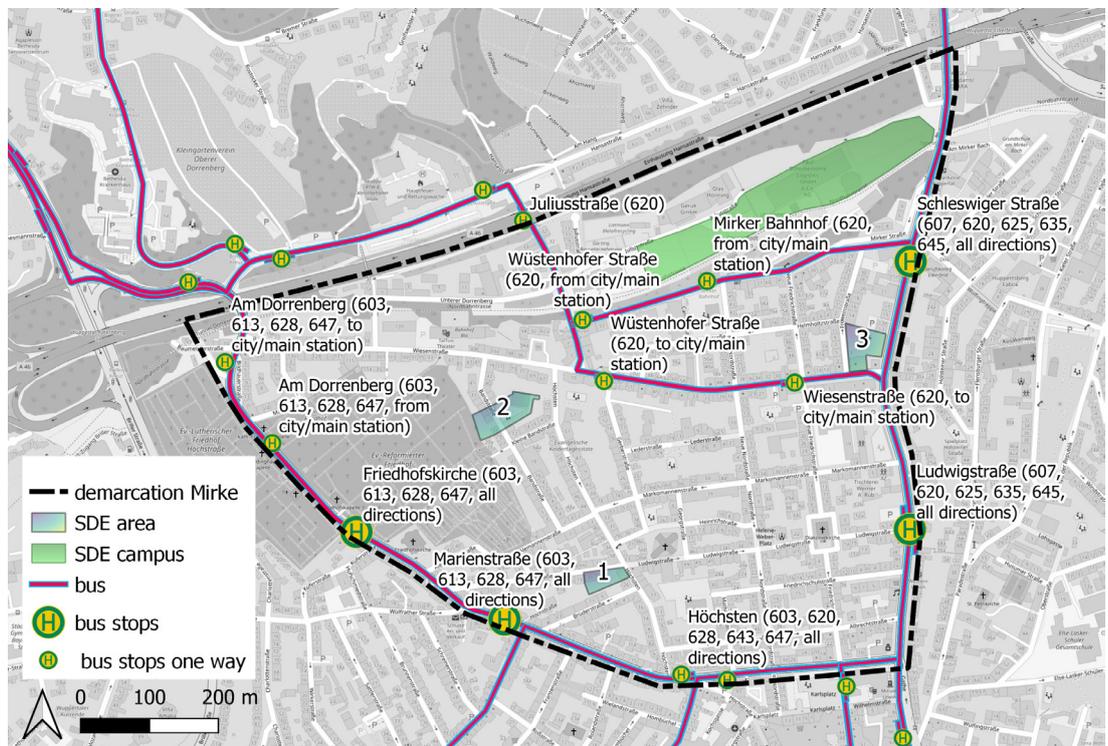


Figure 13: Public transport offer (map basis: OpenStreetMap)

PUBLIC TRANSPORT CONT'D

Meanwhile, Public Transport Authority “WSW mobil GmbH” is planning a further public transport service with the establishment of on-demand traffic, which is to run autonomously in the future¹³. On-demand transport is a transport service operated by passenger cars or minibuses and used in places where conventional bus transport is difficult due to space constraints or other restrictions. “They do not follow a fixed timetable or routes. Passengers call the vehicle by phone or smartphone app and indicate where they want to be driven. An algorithm calculates the optimal route to get the passengers to their destination as cheaply as possible.”¹⁴ For this purpose, there will be virtual stops that have not yet been defined. The next figure shows walking distances and minutes from the respective urban situation (SDE area) to the next bus stop.



Figure 14: Footpath distances and walking minutes from the respective urban situation to the nearest bus stop (map basis: OpenStreetMap)

¹³Written source from the WSW mobil GmbH, Netz- und Infrastrukturmanagement (11/111), retrieved November 04, 2019

¹⁴www.vcd.org (2018), p. 2: https://www.vcd.org/fileadmin/user_upload/Redaktion/Themen/Oeffentlicher_Personennahverkehr/modern_und_digital/Position_On-Demand-Ridesharing.pdf, retrieved November 11, 2019



TRAFFIC-RELATED CONFLICT SITUATIONS AND TRANSFORMATION

The townscape of the district is characterized by stationary traffic, which consumes a high proportion of the area and therefore cannot be used for more sustainable urban development. Although the motorization rate in the neighbourhood, at 273 cars per 1,000 inhabitants¹⁵, is lower than the average for Wuppertal (420 cars per 1,000 inhabitants¹⁶) and also the national average (450 cars per 1,000 inhabitants¹⁷), the Federal Environment Agency's target for more sustainable mobility of 150 cars per 1,000 inhabitants¹⁸ is clearly exceeded. In addition, the number of inhabitants has been growing continuously since 2013 and so has car ownership in the neighbourhood since 2010¹⁹. This trend leads to conflicts between parking car traffic on the one hand and pedestrian and bicycle traffic, as well as public transport and rescue vehicles on the other.

In addition, the high car density and the scarcity of parking space increase the search for parking spaces. On the one hand, this in turn leads to a negative feeling on the part of the driver, which often results in illegal parking (ie. pedestrian areas etc.; see Figure 10). On the other hand, traffic performance and thus the emission of pollutants are increased, which in the medium term also has a negative impact on citizens' health.

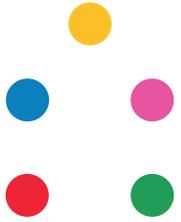
¹⁵ Written source from the Statistical Office of the City of Wuppertal, retrieved November 05, 2019 and November 31, 2019 (with reference to 2018, study area Mirke, 8,622 inhabitants, 2,358 registered passenger cars (private owners))

¹⁶ Reutter, Oscar (2017): Autofreie Innenstadt Wuppertal Elberfeld – Ein Leitbild für die Verkehrswende im Stadtteil, <https://epub.wupperinst.org/frontdoor/deliver/index/docId/6787/file/ImpW10.pdf>, retrieved November 14, 2019. Institution: Wuppertal Institut für Klima, Umwelt, Energie gGmbH

¹⁷ Dziekan, Katrin: Umwelt und Verkehr - geht das zusammen? Presentation for the lecture and discussion event of the DVWG Berg und Mark on 27.06.2019 in Wuppertal retrieved: https://berg-mark.dvwg.de/index.php?eID=tx_nawsecured1&u=0&file=uploads/media/2019-06-27neu_Dziekan_Uni_Wuppertal_DVWG_Handout_1_.pdf&t=1571166136&hash=c3c26cfc9d9bc65671fb78c98802cd49caa42242

¹⁸ Cf. Umweltbundesamt (Ed.) (2017): Die Stadt für Morgen – Umweltschonend mobil – lärmarm – grün – kompakt - durchmischt, Dessau-Roßlau, p. 13: https://www.umweltbundesamt.de/sites/default/files/medien/421/publikationen/20170505_stadt_von_morgen_2_auflage_web.pdf, retrieved November 07, 2019

¹⁹ Written source from the Statistical Office of the City of Wuppertal, retrieved November 05, 2019



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TRAFFIC-RELATED CONFLICT SITUATIONS AND TRANSFORMATION

These and other current traffic-related conflicts are taken up in the civic initiatives – “Mobile Mirke” and “Forum Mirke” - and possible solutions are sought. These initiatives record the neighbourhood needs with regard to traffic and thus contribute to a transformation. They promote that the city and the municipal utilities care for residents` needs, and that measures for a traffic turn are implemented. Examples are: the Nordbahntrasse, the construction of loading infrastructure and a free bicycle rental service, the planned expansion of car sharing, and the conversion of roads for bicycle traffic.



Figure 15: Transforming Transport Projects in the quarter (Photo: Olivia Spiker)

20_12_2019



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