

## CASE STUDY

# InnovationCity Ruhr: Model City Bottrop

Bottrop (Germany) is a leading example of a former coal-mining, highly industrialised city that has combined a future-oriented transition process with ambitious CO<sub>2</sub> mitigation targets. The holistic approach builds on innovative partnerships, and has strong buy-in of industrial players.

### DESCRIPTION

**Location:** Bottrop, Northern Ruhr Region, North-Rhine Westphalia, Germany

**Type of action:** Promoting energy efficiency measures and emissions reduction

**Actors:** businesses, intermediaries, public authorities, housing companies, banking sector, civil society, industry, research

**Financing conditions:** EU funds, private investments, State-level ("Land") ministries, research grants



## KEY POINTS



### APPROACH

- A 10-year project on the ecological revitalisation of urban areas, initiated by incumbent industrial actors in the Ruhr region.
- Public-private partnership governance approach in the form of the InnovationCity Management GmbH (Limited Liability Company).



### ENABLING CONDITIONS

- High degree of commitment of all stakeholders (society, public authorities, local and regional government, industry partners).
- Open and free energy consulting services for locals in Bottrop, and sophisticated financing schemes available for energy efficiency measures in the housing sector.



### CHALLENGES

- Organising multiple participation processes over the 10-year project duration, gradually achieving deeper and more meaningful participation of stakeholders.
- Reducing GHG-emissions in industry, given realities such as industrial requirements for low cost energy sources, the substantial costs of infrastructure investments, etc.



### ACHIEVEMENTS

- Lowering barriers for sustainable investments of real-estate owners.
- CO<sub>2</sub> emission reductions of 38% in only 5 years.



## INITIATIVKREIS RUHR

In 2009, a regional body known as *Initiativkreis Ruhr*, which consists of private companies and other local organisations, launched the *InnovationCity Ruhr* competition. Its goal was to find a pilot city in which to test sustainable structural change in the region. Bottrop proposed a participatory blueprint for the governance of an ambitious low-carbon transition process, and was subsequently selected from among the 16 applicant cities.

## Introduction

Bottrop, with a population of 117,000 inhabitants, belongs to the northern Ruhr district and is a typical representation of an industrial town. Its population and structure have been shaped by coal mining for over 160 years. In fact, it had the last hard coal mine in Germany, which was in operation until 2018.

In 2009, a regional body known as *Initiativkreis Ruhr*, which consists of private companies and other local organisations<sup>1</sup>, launched the *InnovationCity Ruhr* competition. The goal of the competition was to find a pilot city in which to test sustainable structural change in the region. Bottrop proposed a participatory blueprint for the governance of an ambitious low-carbon transition process, and was subsequently selected from among the 16 applicant cities.

'*InnovationCity Ruhr | Model City Bottrop*' (official name, otherwise known as "IC") aims to achieve low-carbon revitalisation of urban quarters, by employing best-available technologies, as well as socio technical approaches.

IC has the target to halve its CO<sub>2</sub> emission by 2020 compared to 2010 levels. To do so, it has implemented hundreds of projects, mainly in the fields of energy efficiency in buildings, renewable energy generation, decentralised power generation, and sustainable urban development. The general aim, in addition to cutting CO<sub>2</sub> emissions, is to increase quality of life in the highly-industrialised city.

One of the main concepts of the city's transition is the so-called, *Energy transition from the bottom*, which calls for the transformation of local energy consumers into energy producers and consumers. Innovative ideas have been implemented to achieve this goal, such as Combined Heat and Power (CHP) technology, renewable energy utilisation, and energy efficiency modernisation in buildings.

The city has also set a goal to prioritise climate-friendly, sustainable urban development by focusing on green (low-emission) transportation.

Bottrop develops its solutions using a network-based approach and collaboration between industry, academia, businesses, and municipal and state administrations. All stakeholder groups dealing with energy supply and energy demand are targeted.

Not only has the city set the ambitious goal to redevelop itself, but it is also sharing insights gained with the larger region. A regional project called '*InnovationCity roll-out*' aims to transfer the experiences from Bottrop to 20 other cities in the Ruhr area. This conceptual project was financed by the European Regional Development Fund and co-funded by the regional government, with a total investment of about €3.5 million. National funding (from the agency KfW) will play an important role if the region's cities opt to implement the concept.

The IC Management GmbH (ICM), which was set up after the Bottrop was selected for the pilot in 2012, serves as a connecting interface between stakeholders from diverse institutional spheres. This public-private body includes staff from associated companies and the municipal administration. It has 25 employees who coordinate approximately 300 projects. A dedicated department called '*The Centre for Information and Consultation*' (*Zentrum für Information und Beratung*) provides information to locals on energy efficiency.

The operation of the managing body is based on the 1,300-page master plan that was developed to outline a clear path and vision for the transition process. The plan was endorsed by the Bottrop City Council, and proposes implementing 350 measures that take into account technological, social, environmental and economic dimensions.

<sup>1</sup> IR is an association that brings together almost 70 leading international companies from the Ruhr region that aim to spur innovation in the area and promote the region's image, in order to forge a prosperous future economic model. <https://i-r.de/>

Researchers have carried out numerous analyses of the project, particularly examining the case from an urban governance perspective. To do so, public, private and intermediary actors with varying interests and capabilities interacted using a network-based steering approach, and results were recorded and analysed. Different small group formats were established in order to support cooperation among the different actor groups.

Other research indicated that ICM acts at the intersection of different competence areas, rationales and organisational cultures, and as a resource for project development in the urban transition in Bottrop. This is a best practice example of how an intermediary organisation can concentrate power in order to successfully steer and plan urban energy transition.

**Key challenges**

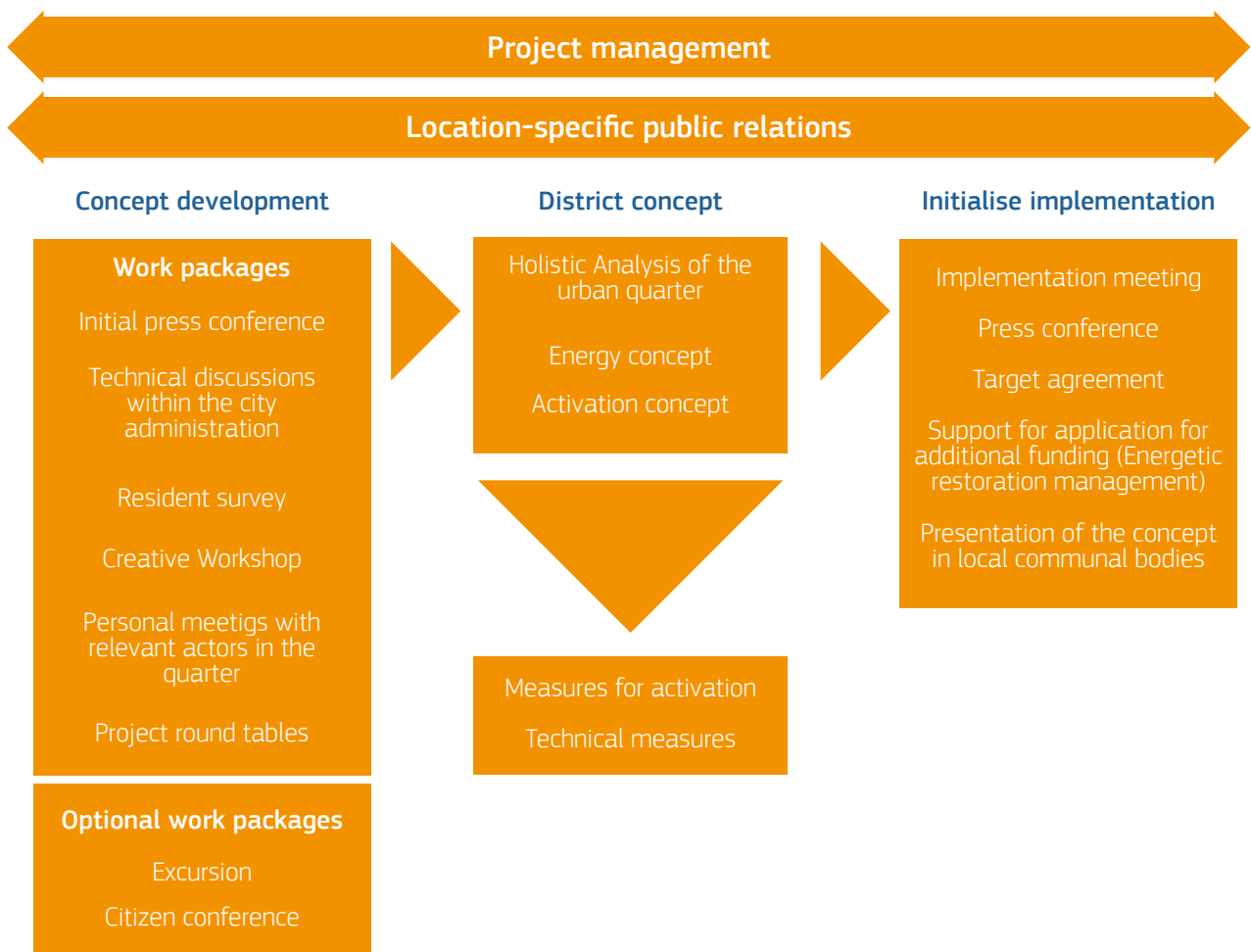
The modernisation rate of buildings in the region had been low prior to the project, due to a mix of lack of information on the benefits of energy efficiency measures and relatively low financial means of home owners. This is the case in

many regions across Europe. In Bottrop, these challenges were addressed with a targeted mix of information campaigns and financial support options.

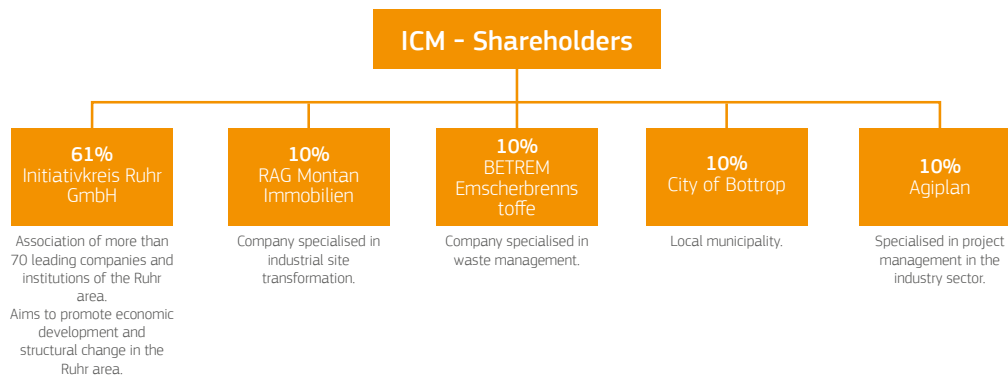
In the initial phase of the project, some press reports led to false public expectations regarding the amount of subsidies that would be made available. Correcting these expectations was a longer process than expected, which challenged the image and success of the project in its early days.

In the industrial sector, forging better energetic cooperation (e.g. using surplus heat from industry for other heating purposes) was hindered by a variety of obstacles. Potential energy savings turned out to be a rather weak incentive for companies that already had relatively low energy demand. Upfront investments for infrastructure proved an additional obstacle to low-carbon transition in the industry sector.

Above all, Bottrop found that the support of the municipal administration was of great importance. When uncoordinated parallel processes occurred simultaneously at the city level and in IC project management, the overall project faced the serious risk of having its credibility called



**FIGURE 1**  
Concept and implementation of the InnovationCity roll out (own translation)



**FIGURE 2**

**Shareholders in the InnovationCity Management GmbH – a private company and intermediary, which serves as a platform and facilitator for projects in Bottrop.**

into question. Separation of both processes has given actors flexibility and autonomy, but closely coordinated strategies are needed to ensure that work is complimentary.

### Enabling conditions

A network of leading commercial enterprises and research institutions from all over Germany develop projects in Bottrop; this means that the area has a very strong knowledge-base. The highly qualified labourforce with strong technical expertise and transferable skills can be beneficial for the priorities of energy efficiency and renewable energy.

A main driver that kickstarted the transition process was the initiative taken on by the Initiativkreis Ruhr industry network and the mayor’s commitment to bolster this work. After winning the pilot city competition, the City of Bottrop had access to more resources and funds, as well as intellectual support, all of which accelerated the process of ecological modernisation that the city had already begun.

The project has benefited from diverse funding sources. The basic operations of the public–private partnership are financed by different sources, including the regional government of North-Rhine Westphalia, the Initiativkreis Ruhr and its involved corporations, as well as the municipal government. On the project level, each project has an individual funding scheme. Some projects are funded by European Union structural funds, while others rely on funds brought in by corporations. Numerous companies contribute several hundreds of thousands of euros per year to individual IC projects, often in multi-stakeholder consortia. Homeowners’ private investments are co-funded by urban development programmes run by Northrhine-Westfalian ministries. Private households are also investing in PV, wind energy installations and in one solar cooperative, which is mostly situated in the rural parts of northern Bottrop. Research projects are realised by research and technological development grants from ministries and foundations.

Together, all government and non-government stakeholders in the region had invested €183 million in low-carbon transition by 2015. Between 2010 and 2020, a total of €290 million will be invested.

Bringing in housing companies and real-estate owners has been very successful in Bottrop. The rate of energetic modernisation in the pilot area (14,500 buildings) is about three times higher than the German average. Key to the city’s remarkable success has been consulting services, which are offered to locals free of charge. The service provides individuals with 2-3 consulting appointments, including sharing concrete recommendations for investment and calculations regarding energy savings associated with these investments.

In addition, locals are provided with financial support, and individual real-estate owners are eligible to apply for grants from the federal state to enact energy efficiency measures. Direct financial support is mainly for energy-related modernisation in the housing sector, such as low-threshold measures like thermal insulation of top storey ceilings. Subsidy amounts can go up to 25% of the investment cost, depending on the type of building and its CO<sub>2</sub> emission reduction potential.

### Achievements

The Bottrop master plan has been successfully implemented, which was mainly enabled by accompanying research on the city’s characteristics. Two hundred measures of the master plan have already been implemented, or are in the process of being implemented. These are mainly related to sectors like housing, energy, mobility, infrastructure, and working environments, and include:

- Within the national urban development strategy ‘Zukunftsstadt’, inclusive projects such as neighbourhood gardens and shared mobility concepts were launched.

- The “Zukunftshäuser+” project demonstrates how existing buildings can be refurbished to an energy-positive standard. They illustrate the performance of technological innovations and the expertise of industrial partners. The buildings set new technological standards and are presented to groups from abroad.
- Under the motto “Sun Weld Steel,” a local metalworking organisation has developed into an energy self-sufficient company. A PV-system supplies the high-energy production processes, such as welding. For an increase in efficiency, a storage system is being planned and the company uses renewable raw materials in pellet and firewood burners for heating.
- The “CHP 100” project creates 100 Combined Heat and Power plants. Current research and development activities aim at integrating the single CHP into a virtual power plant. The ‘from-lab-to-market’ initiative is controlled by the ICM from modelling to set-up to monitoring.
- Other measures include the development of cycle paths and advanced low-carbon mobility concepts. In addition to technological and infrastructure projects, support actions aim at improving quality of life, urban gardening, and education.

Local craftspeople, architects and energy consultants have been identified as an integral part of implemented measures, prompting the creation of an IC partner network. All network members have committed themselves to specific quality standards for energy retrofitting, with relevant knowledge acquired in training courses. The creation of standards has partially formalised the rules for energy refurbishment in accordance with the objectives of the ICM.

In addition to the implementation of several new projects, transparency and citizen involvement have been key to the programme from the beginning, mostly enacted through informational events. In addition, citizen ideas and visions were collected at workshops, and suggestions regarding the master plan could be sent to an online idea box or directly handed to planners.

The free energy-efficiency consulting services proved to be particularly successful. In 2015, there were 3040 energy consultings – in other words, 30% of local building owners had been directly contacted by IC. More than every second person (56%) of the consulted building owners subsequently implemented energy efficiency measures in their home.

Between April 2014 and September 2015, 111 individuals applied for a financial support totalling €3.58 million. The city has already accepted grants, and another €382,000 has already been invested. This is equivalent to an average support quota of almost 15%, while regional and the national governments are being called on provide sufficient funds and loans to cover the remaining funds needed for energetic modernisation.

## Further Reading

🔗 [Case study: InnovationCity Ruhr | Model City Bottrop: A Blueprint for a Futureproof City](#)

### Information in German

🔗 <https://icm.de/>

🔗 <http://www.icrollout.de/>

**Best, B. (2019). Energiewende und Bürgerbeteiligung - Multi Level-Konstellationsanalysen des Beteiligungsprozesses der InnovationCity Ruhr – Modellstadt Bottrop. Wiesbaden: SpringerVS.**

**Mattes, J., Huber, A., & Koehrsen, J. (2015). Energy transitions in small-scale regions: what we can learn from a regional innovation systems perspective. Energy Policy, 78, 255–264.**

**Schepelmann, P. (2018). Governance of Low-Carbon Energy System Transitions: A Case Study from North-Rhine Westphalia, Germany.**

🔗 <https://www.adb.org/publications/low-carbon-energy-system-transitions>

## IMPORTANT LEARNING POINTS

- Deep emission reductions on a local level are possible: through its projects, information and support programmes, Bottrop has already cut 38% of carbon emissions in only five years
- The network-based, intermediary power of a development institution like the ICM can be crucial to successfully steer and plan an urban transformation over the medium- and long term
- Free, standardised energy-efficiency consulting services can help to significantly lower the barriers for private investments in sustainability projects
- Enabling institutions like the Initiativkreis Ruhr industry network and committed support of political leaders and other local urban development actors are crucial for success

# Platform for Coal Regions in Transition

The Platform for Coal Regions in Transition is an initiative by the European Commission.

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