



Topics in Environmental Policy

Paul-Michael Bever, Ludwigshafen 20 May 2019

 **BASF**

We create chemistry

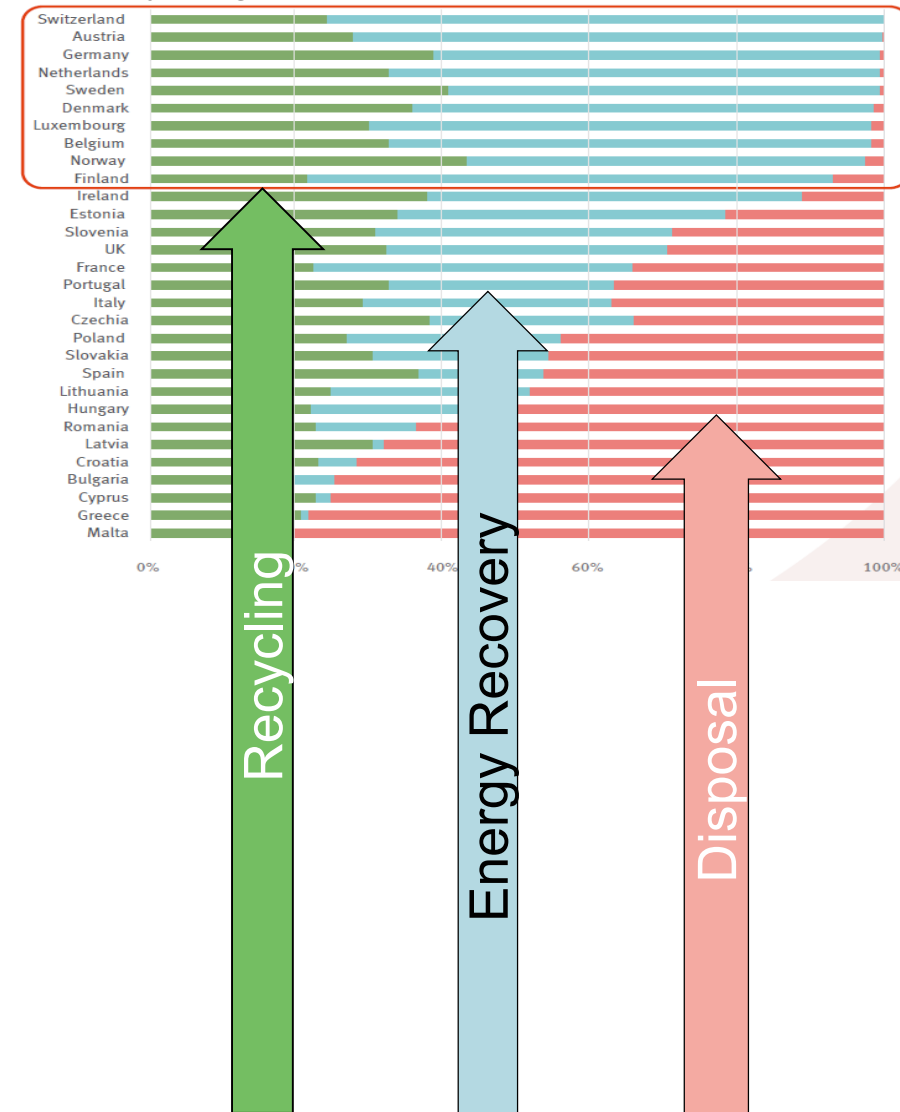
Current Topics in Environmental Policy

- Circular Economy
 - ▶ Ambitious targets
 - ▶ Game changer: it's the economy
 - ▶ The role of the Chemical Industry
- Permitting: Public Participation in Decision Taking
 - ▶ Seveso Directive: Safety Distance
 - ▶ Role of the public in decision taking
 - ▶ BASF: plant safety and transparency

Status of EU Waste Management: Facts

- Waste management varies considerably:
 - ▶ Harmonisation needed: landfill bans implemented in 8 member states
 - ▶ Recyclability varies with market segment
- Unless regulated, waste management follows the lowest cost
 - ▶ Landfilling costs < energy recovery costs
 - ▶ 30 to 40 % of plastics waste can be recycled profitably

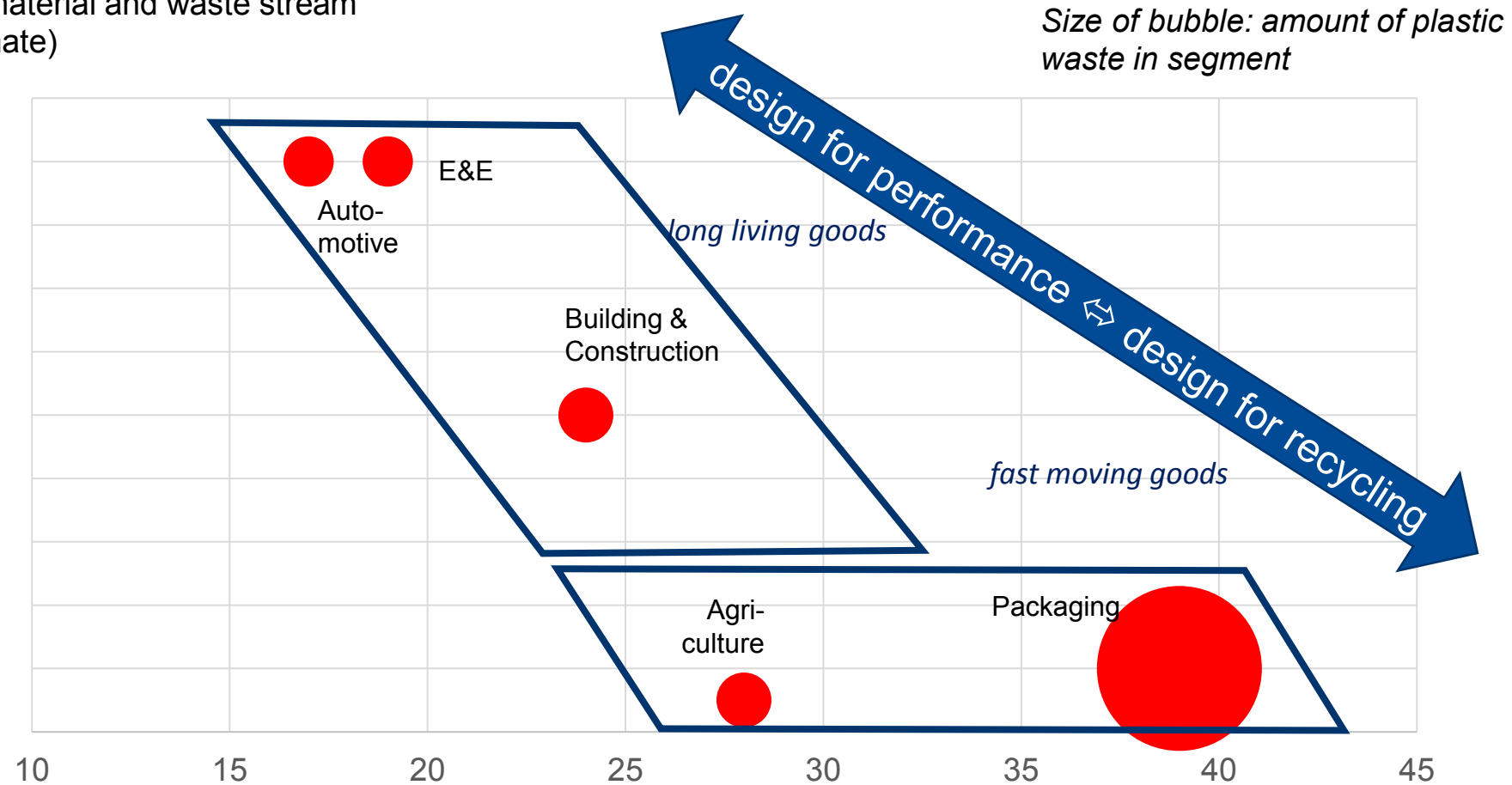
Recycling Rates (%) in EU Memberstates



Recycling Reality

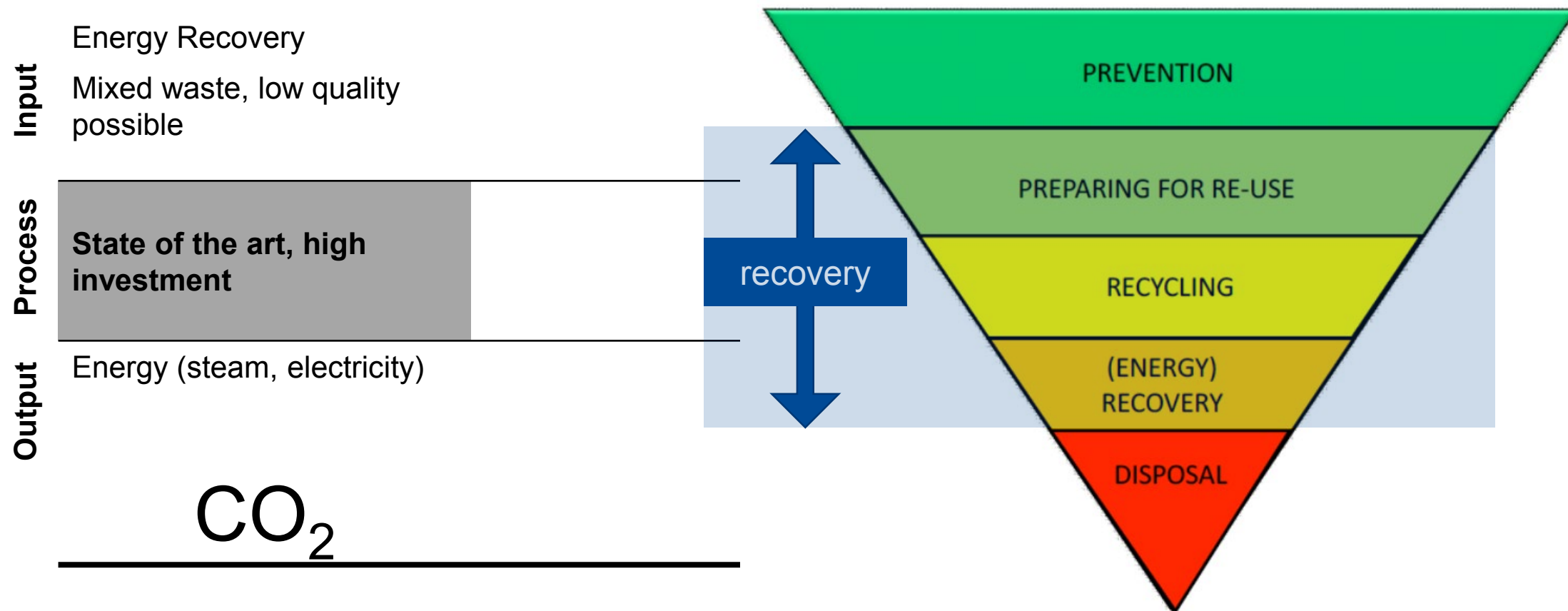
Complexity

of plastic material and waste stream
(own estimate)

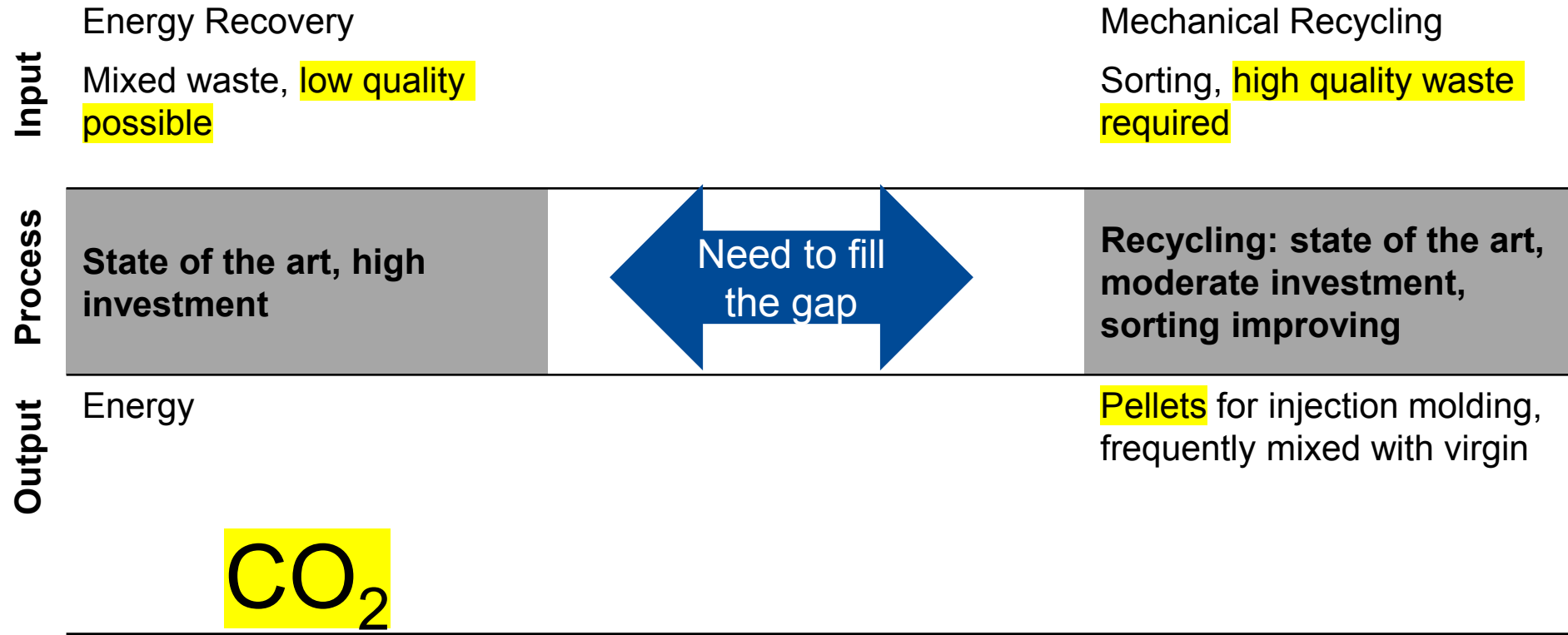


Recycling share of total disposal (Consultic, data EU, 2014)

Recovery: Energy Recovery state of the art



Recovery Options



Recovery Options

Input	Energy Recovery	Chemical Recycling	Mechanical Recycling
	Mixed waste, low quality possible	Mixed plastics possible, quality determines economics	Sorting, high quality waste required
Process	State of the art, high investment	Not yet mature, very high investment	Recycling: state of the art, moderate investment, sorting improving
Output	Energy (steam, electricity)	Syngas, oil/carbon, monomers	Pellets for injection molding, frequently mixed with virgin
CO ₂			CO ₂

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	CO ₂	CO ₂	
	dominant in 9 EU member states	Hardly used, room for improvement	Favoured (waste hierarchy, plastic strategy)
	10.2 Mio.tons/a (40 %)	0,01 Mio.tons/a (<1%)	7.6 Mio.tons/a (29 %)

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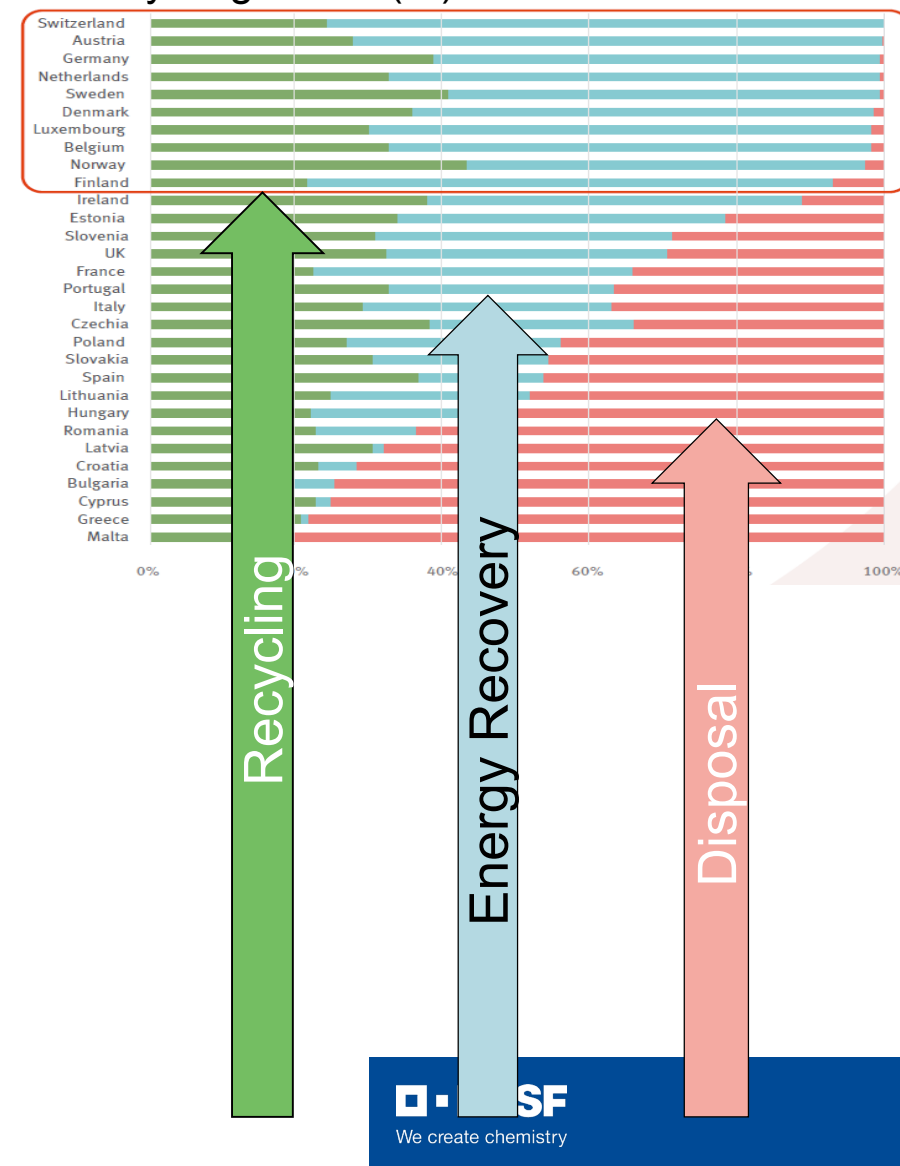
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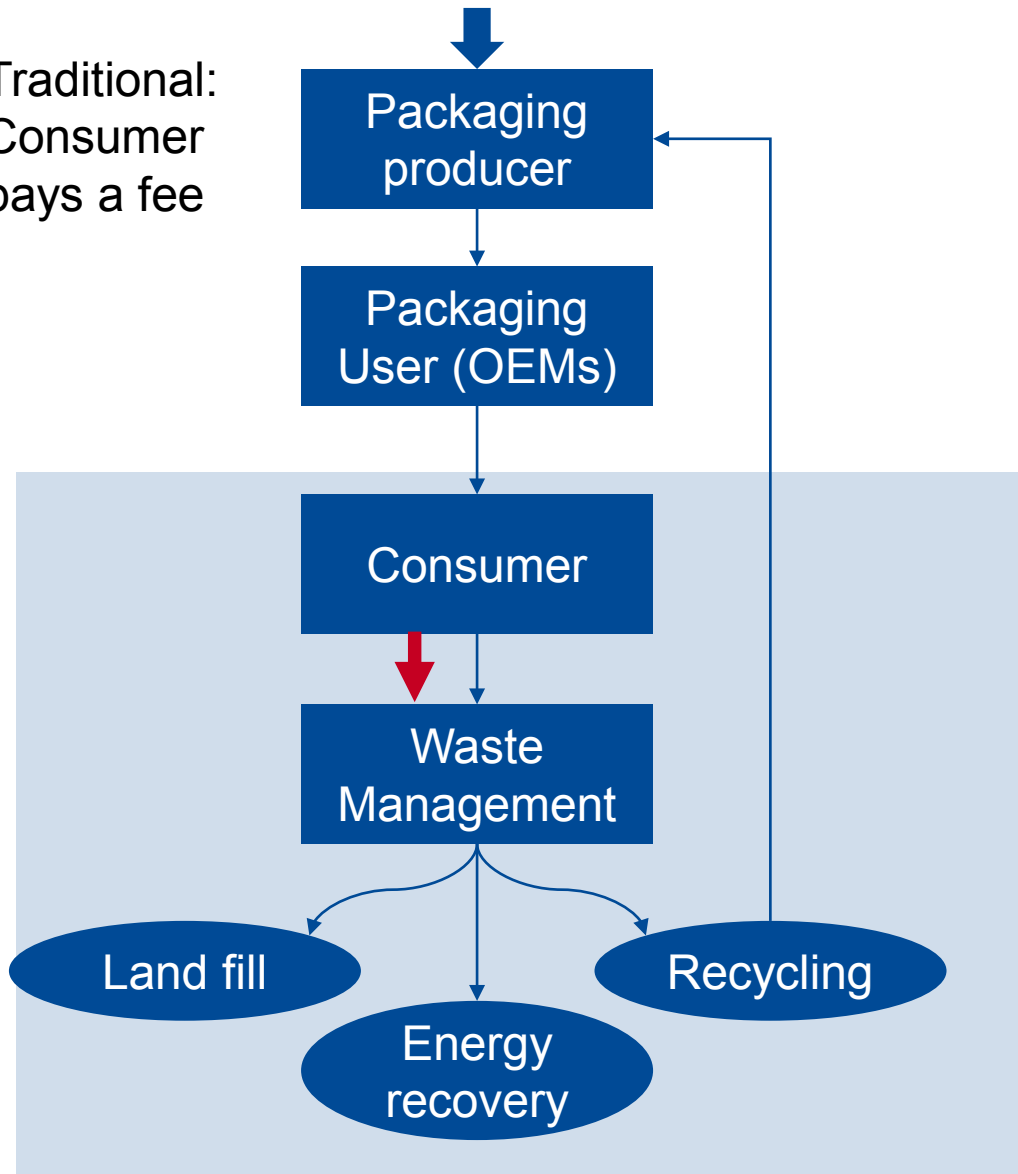
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Recycling Rates (%) in EU Memberstates

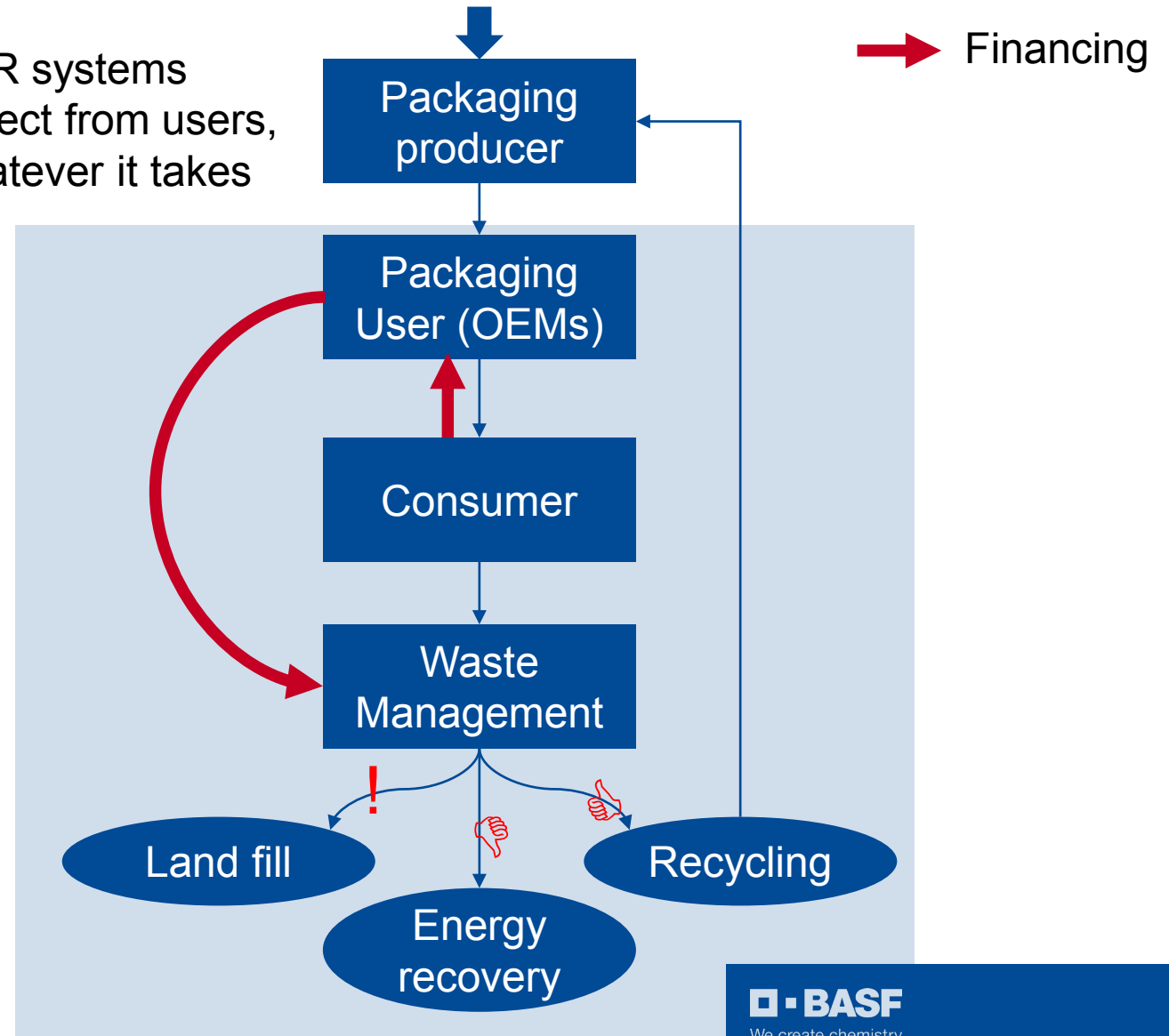


Financing of Disposal: Extended Producer Responsibility

Traditional:
Consumer
pays a fee



EPR systems
collect from users,
whatever it takes



Current Topics in Environmental Policy

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Reasons for BASF to start chemical recycling



Through chemical recycling, **plastic waste** which currently is landfilled or incinerated can and will be **recycled**.



Customers have committed themselves to use recycled material in their products. We help our customers achieve these targets.



Regulations all over the world are aiming to increase the recycling of plastics, e. g. through **higher recycling targets**.



Pyrolysis oil or gas can partly **replace fossil feedstock** as raw material, saving fossil resources.



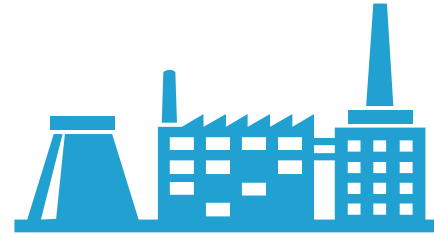
Chemical recycling is currently tested with first pilot products. BASF intends to develop the technology on an industrial scale

With ChemCycling we can:

Recycle plastics for which there are no mechanical recycling solutions



Turn waste into feedstock for the chemical industry



A third party certified system allocates the proportion of recycled resources in each product



Remove undesired substances in the process



Produce virgin-grade recycled material



Mass balance approach: how does it work?

Raw material

Fossil



recycled

Use of recycled feedstock in very first steps of chemical production (e.g. steam cracker)

BASF production Verbund



Utilization of existing Production Verbund for all production steps

Products

conventional

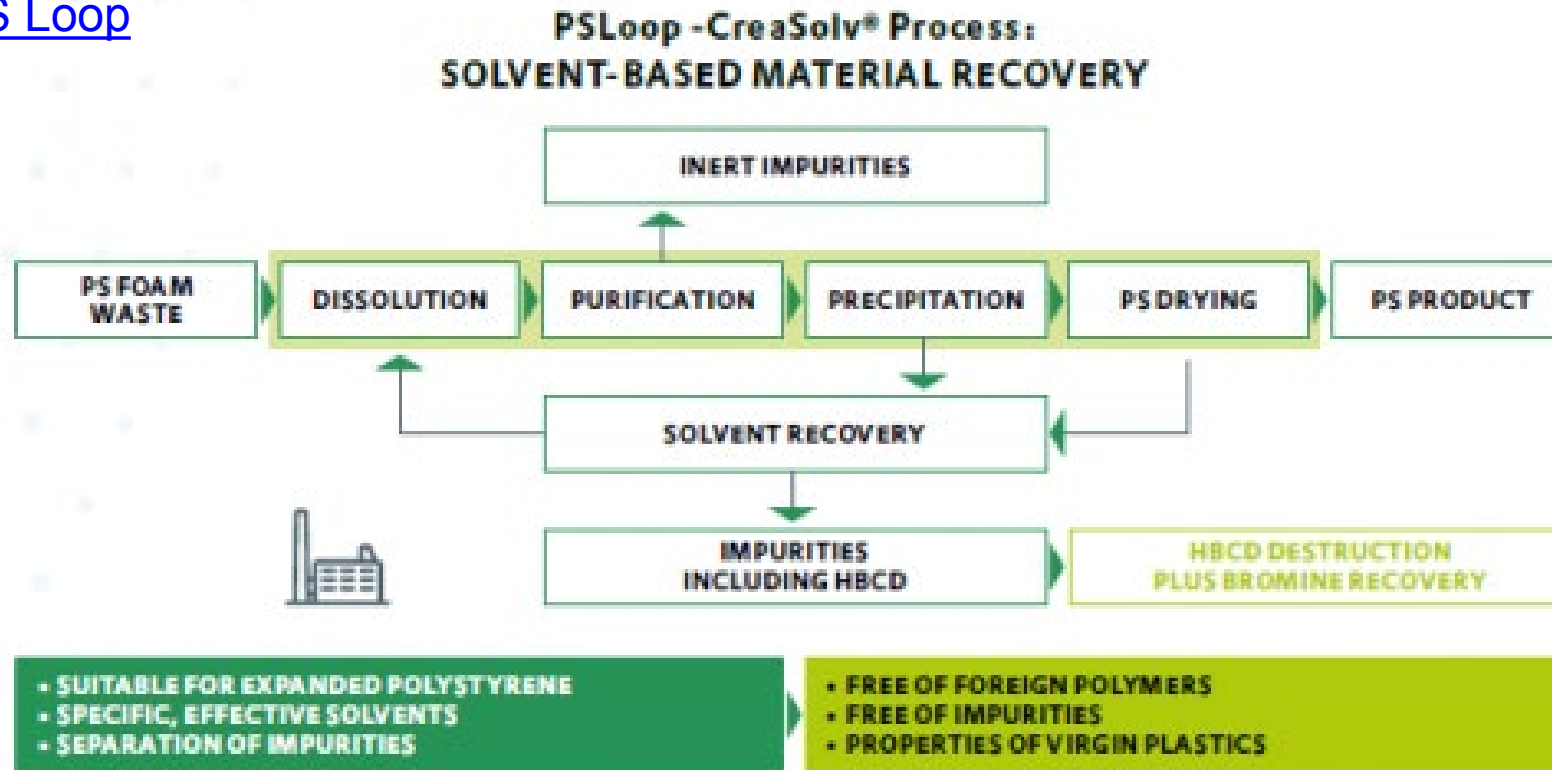


allocated

Allocation of recycled feedstock to selected products

Chemical Recycling – value chain approach: EPS containing flame-retardant HBCD (hexabromocyclododecane)

PS Loop



Permitting: Public Participation in Decision Taking

- ▶ **The Issue:** Seveso Directive: Safety Distance
- ▶ **The Challenge:** Role of the public in decision taking
- ▶ **BASF Response:** plant safety and transparency

Verbund Site Ludwigshafen

The largest coherent chemical site in the world,
owned by only one company.



35,316
Employees
BASF SE



~ 230 km
Rails



~2000
Buildings



~ 106 km
Street



~200
Production
facilities



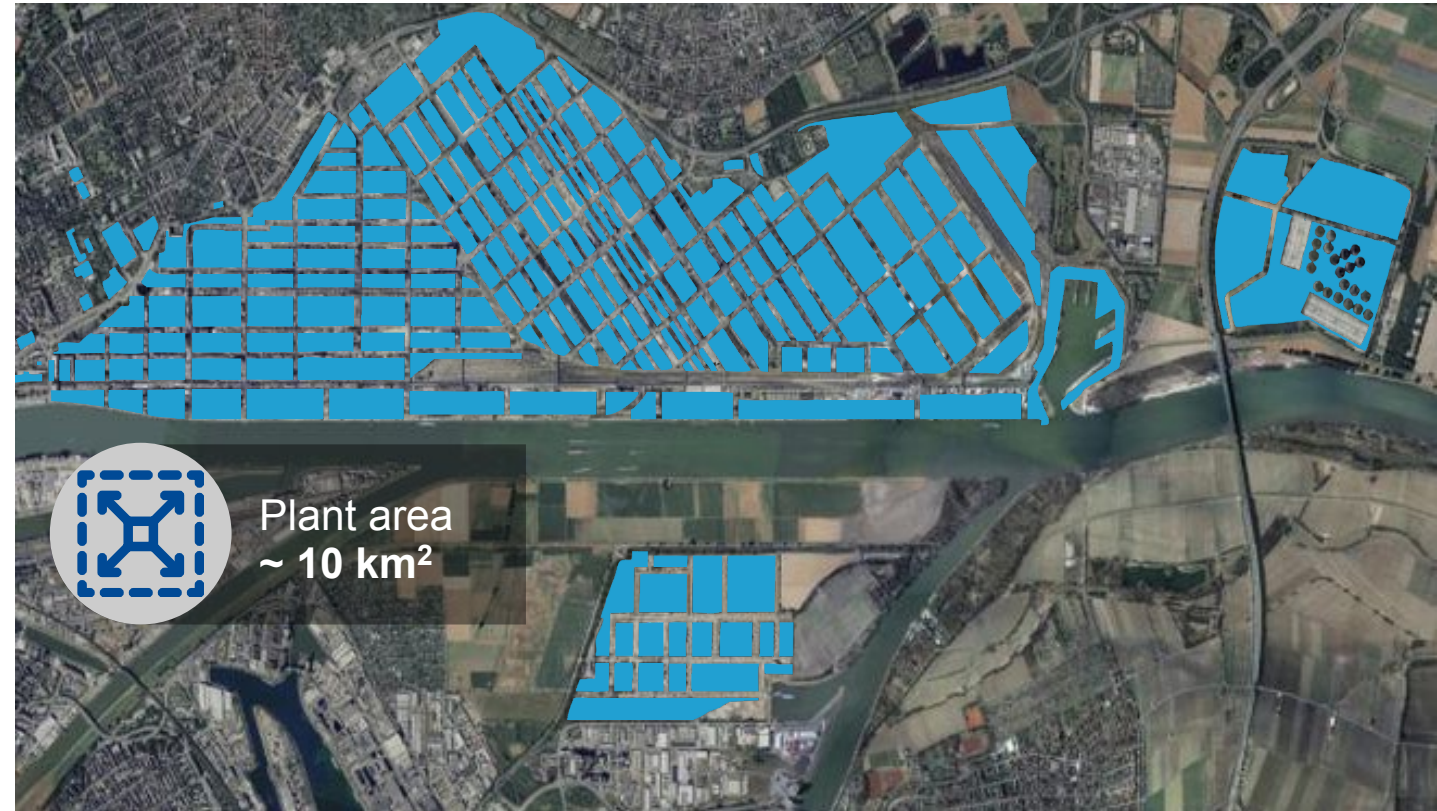
~ 2,850 km
Pipes



**Moreover
thousand**
Products are made
at the Site



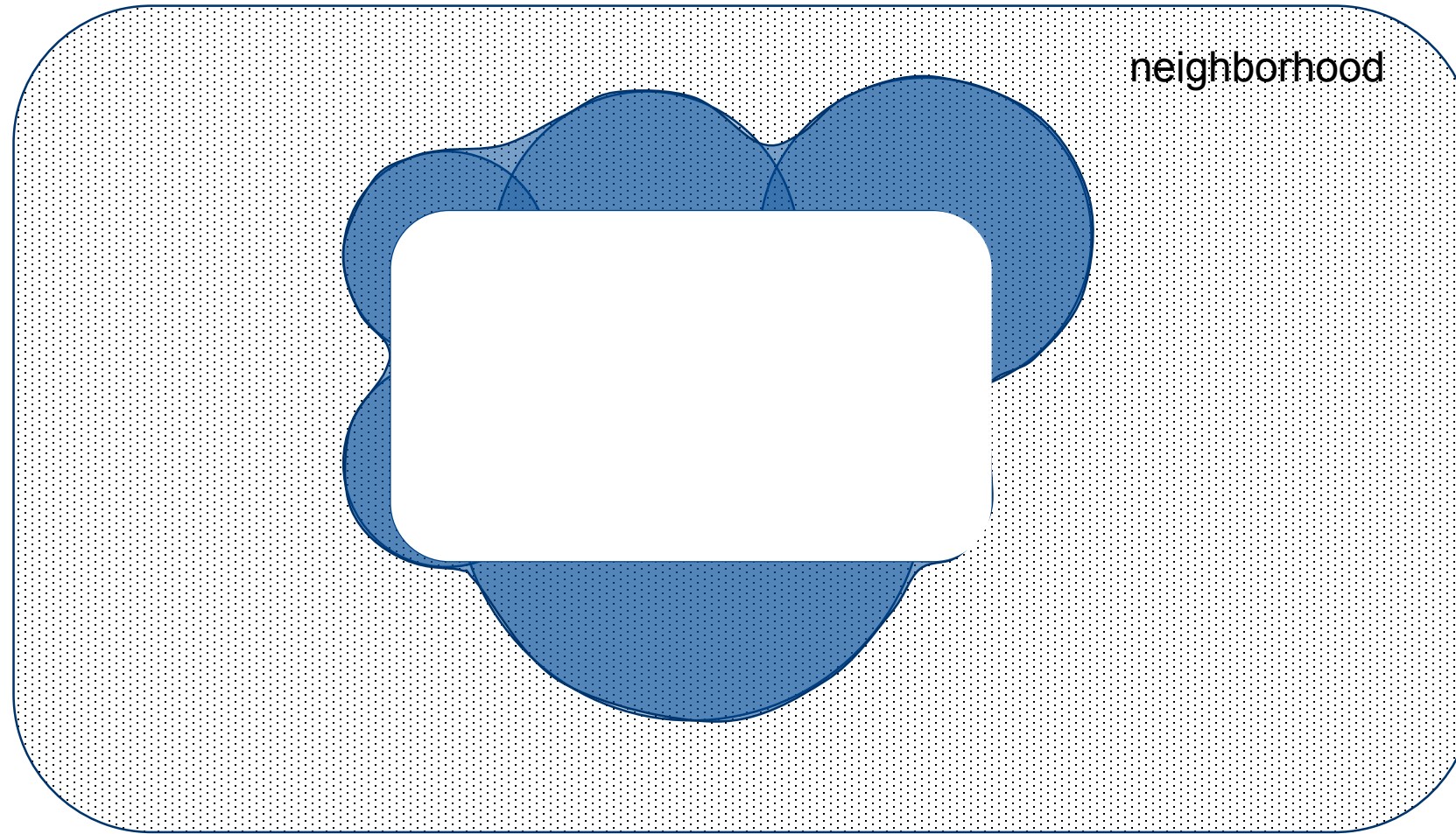
8.5 Mill. t
Readymade
product per
year



Background Seveso-Directive

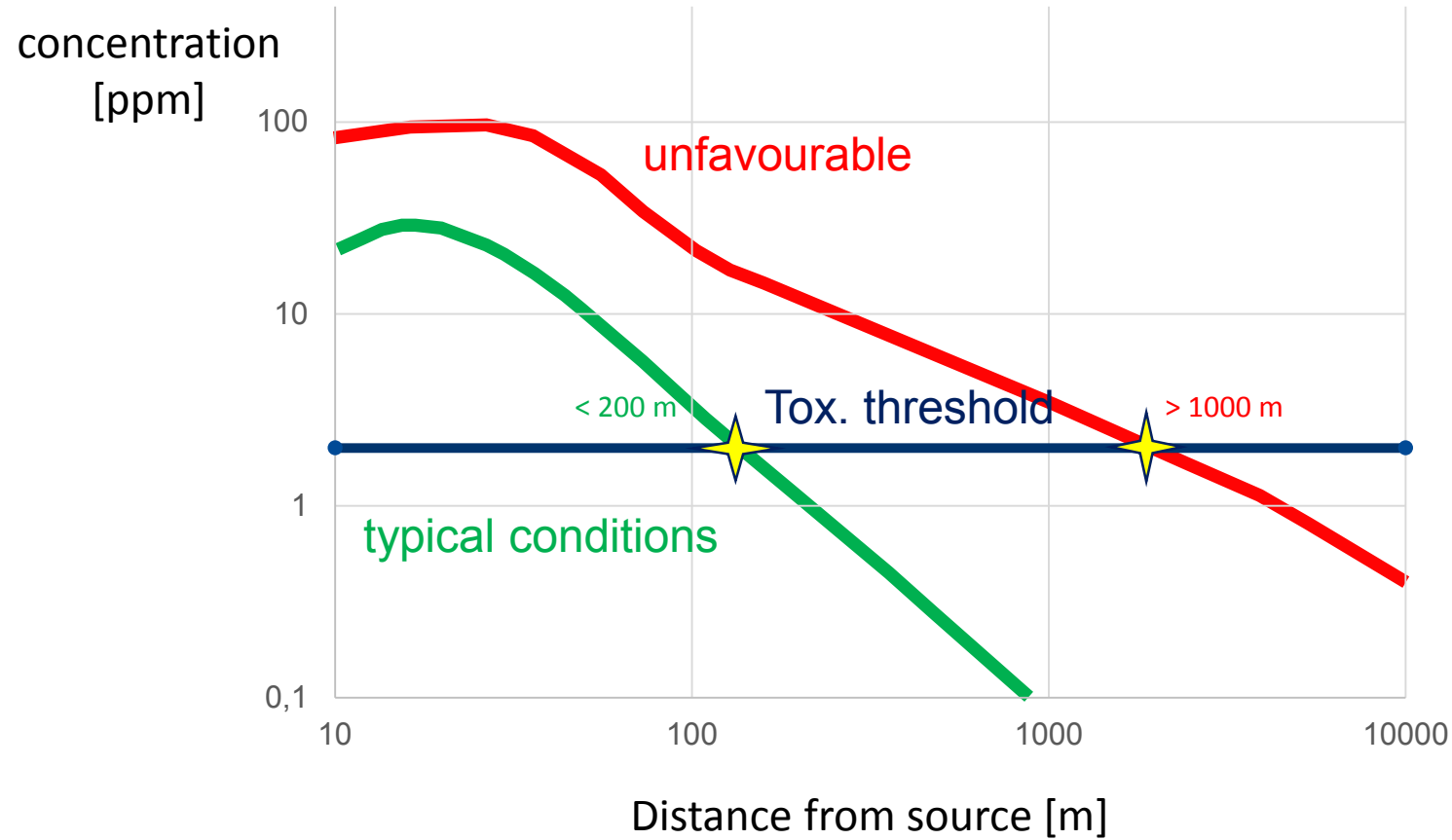
- **Objective:**
Minimize the impact of severe chemical accidents.
- **New:**
Public Participation in Decision Taking
- **Consequence:**
more transparency
 - ▶ Emergency planning
 - ▶ Disclosure of chemicals handled
 - ▶ safety distance between production sites and residential areas

Seveso Directive: risk of severe accidents: safety distance between plants and residential areas?



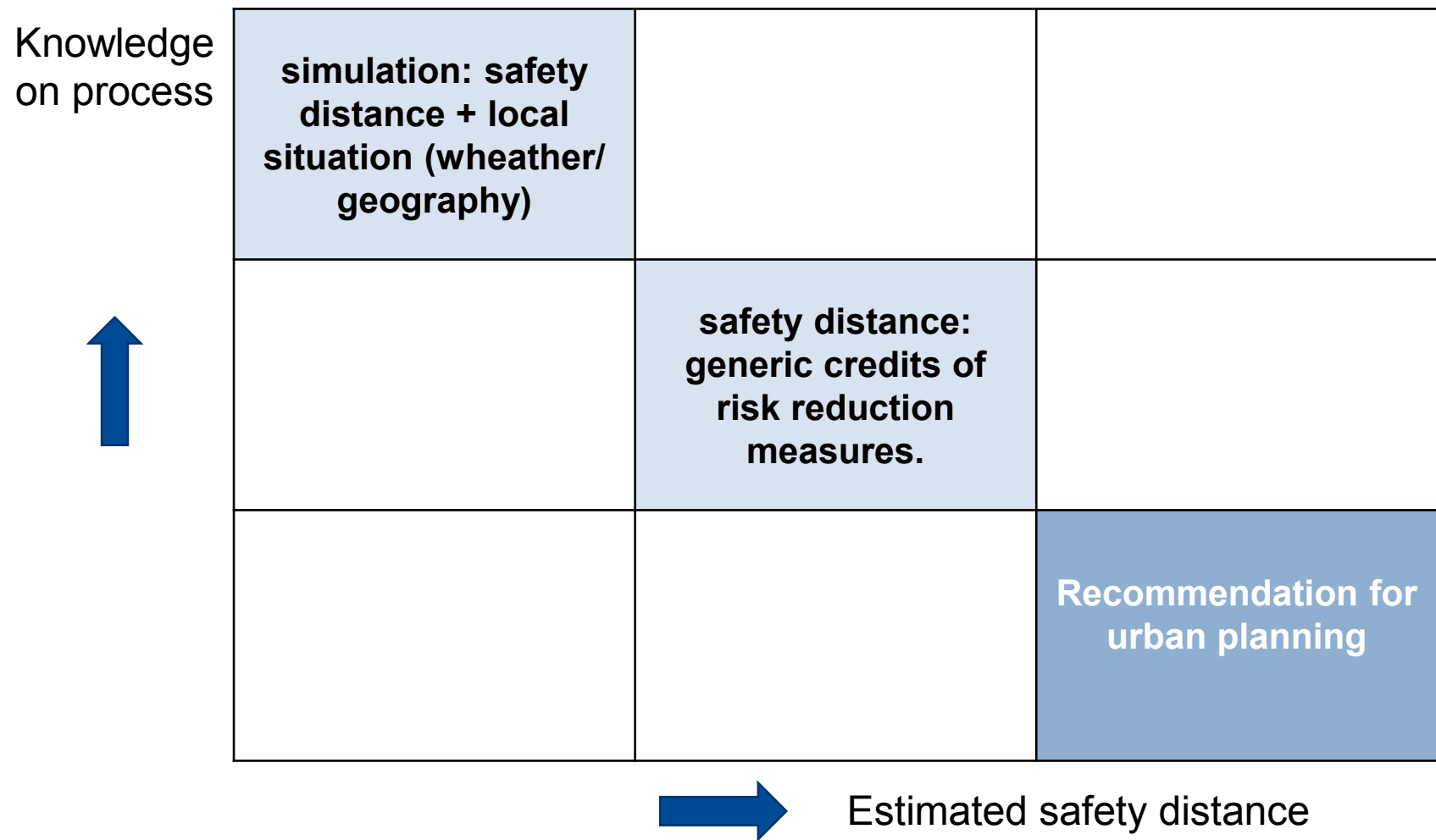
Use restriction for residential areas: emerging conflicts with neighborhood

Safety Distance: depending on boundary conditions



Calculation method not yet standardized

Safety distance



Detail reduces conflicts

Permitting: Public Participation in Decision Taking

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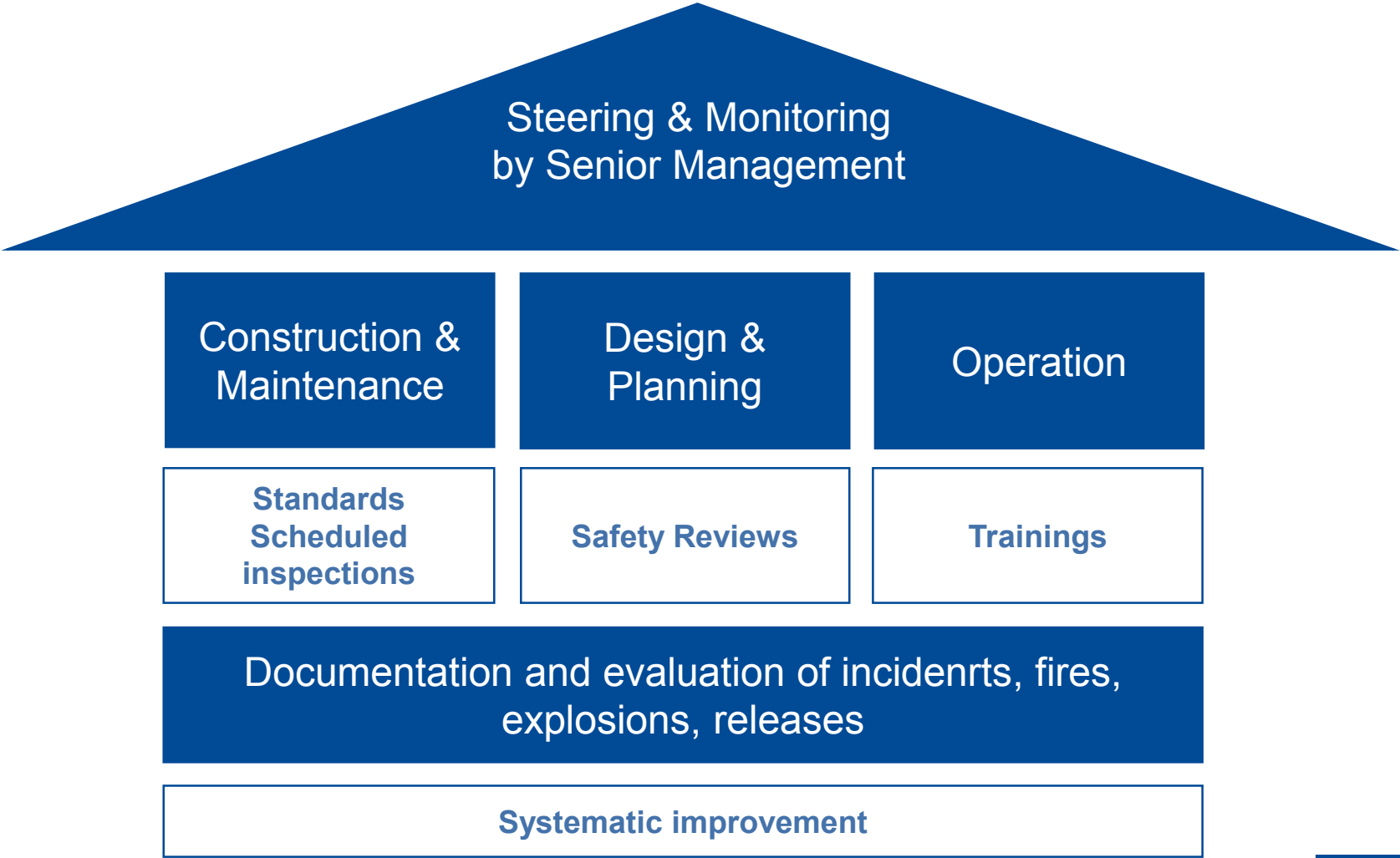
New Permitting Rules: Increasing Risks for Industrial Growth

- ▶ Less notifications, more permit applications:
Number of applications including information requirements increases.
- ▶ Public participation:
More instances. Predictability of outcome and duration of process are of concern.
- ▶ Institutionalized conflict between operators and neighbours:
shrinking basis for public acceptance.

Permitting: Public Participation in Decision Taking

- ▶ The Issue: Seveso Directive: Safety Distance
- ▶ The Challenge: Role of the public in decision taking
- ▶ **BASF Response:** plant safety and transparency

Process Safety at BASF





We create chemistry



We create chemistry

Site relations BASF Ludwigshafen

Engaging with our Neighborhood

Claudia Schönfeld

External Communications & Site Relations Germany

May 20, 2019

A City within a City



35,316
Employees
BASF SE



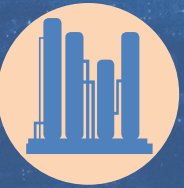
site
area
~ **10 km²**



~**2,000**
Buildings



Rails
~ **230 km**



~**200**
Production
facilities



Street
~ **106 km**



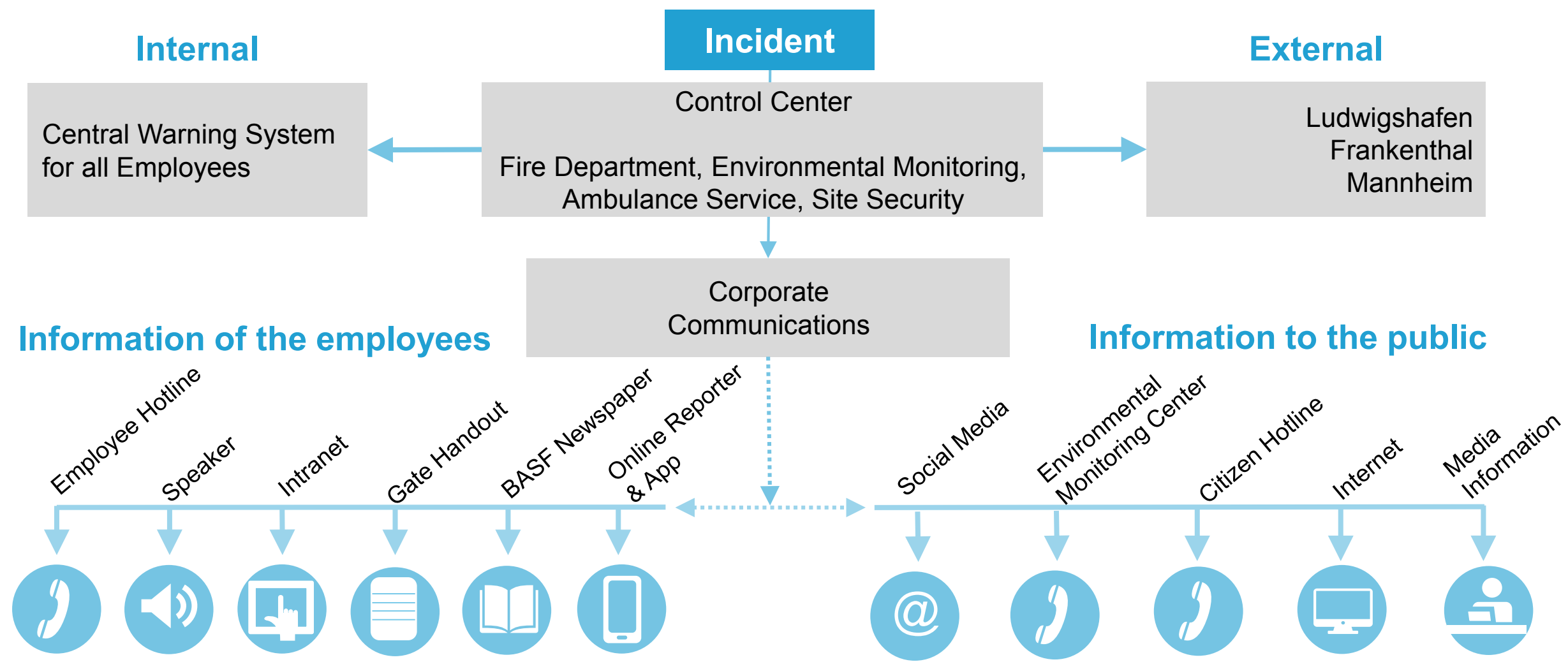
Pipes
~ **2,850 km**





In case of
emergency,
every minute
counts.

Reliable Structures and a clear Chain of Information are a must have



Impact on our Neighborhood



Dialog with Neighbors

The BASF plant premises immediately neighbors residential areas and is located at the heart of the Rhine-Neckar metropolitan area.

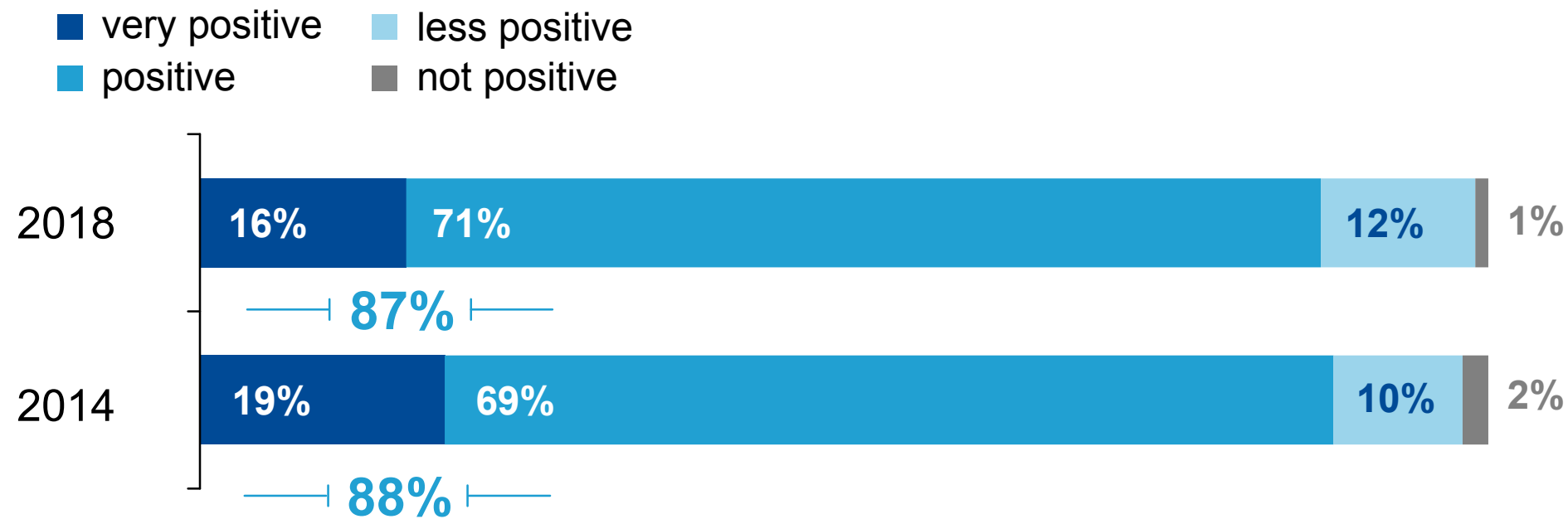
That's why a good connection to its surroundings is especially important. For example, neighbors can receive information about the site from the **Visitors Center**, at the **Neighborhood forums** or at **Open House**.

The BASF **Environmental Control Center** is a contact partner around the clock in the event of environmental problems of all kinds. In order to provide quick, open, and comprehensive information in the case of a hazardous event, BASF also set up a **Public hotline**.

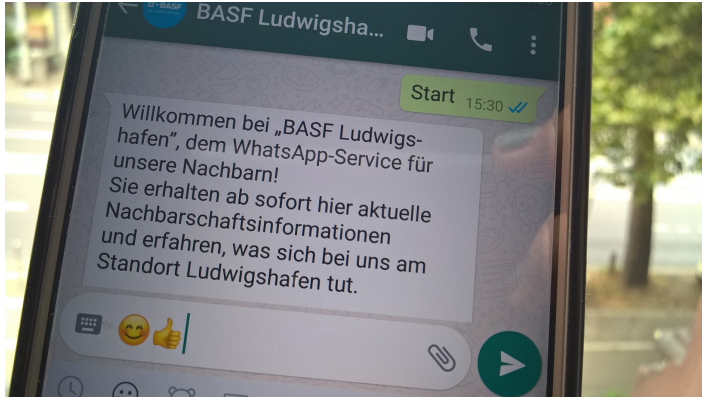


We ask our Neighbors

How is your overall opinion on BASF?



Learn, improve, adapt...we are never „done“



Fast information

Since 2018: WhatsApp service for neighbors with fast information on topics that are relevant for them.



Focus on dialogue

Open house day on September 22, 2018 with clear focus on safety topics and dialogue.



New formats

New formats to bring together BASF experts and interested neighbors.

The Visitor Center

Daily Program

On Weekdays, each day visitors can take part in two German and one English tour through the exhibition and in a tour of the plant free of charge.

Opening hours:

Monday to Friday from 9 AM to 5 PM

Saturday Experience

On the second Saturday of the month, those interested in a Saturday experience will receive insights into the world of BASF from 9 AM to 4 PM.

Excursion for Students

Exclusively for upper-level chemical courses: A half-day student plant tour including a visit to the interactive exhibition in the visitor center.



For a good Neighborhood!

film festival

wine cellar

citizens hotline

Sports clubs

environmental monitoring center

Kids labs

Open house day

restaurant

TV magazine “BASF inside”

„Wissensfabrik“

Concert program

Visitor Center

Public dialogue

WhatsApp service

culinaric events

Corporate archive

„Youth researchers“ contest

Political dialogue

Facebook

housing association



Your
questions
and our
discussion.





We create chemistry