

# FREIBURG

BEN FERRY  
&  
BRANDON TAYLOR



# HISTORY

“Known as the Jewel of the Black Forest”-Beatley

Old German university towns

Known for its ancient university and its medieval minster, as well as for its high standard of living and advanced environment practices.

Translates to “Free Town”

Strategically located at a junction of trade routes between Mediterranean sea and the north sea regions, and the Rhine and Danube Rivers.

The border triangle of France, Germany, Switzerland

RAF bomber on November 27 1944  
destroyed a large portion of the city

World War 2 over 85% of the inner city was destroyed.



# HISTORY



Image © 2013 GeoBasis-DE/BKG  
Image © 2013 AeroWest

# MOBILITY

Pvt Car Only

50% car access/ mix  
bike/transit

Bikes/ Transit

“Best way to get around Freiburg is by public transportation and walking, tickets can be used on all buses, trams and local trains in the area” -Beatley

## Tram

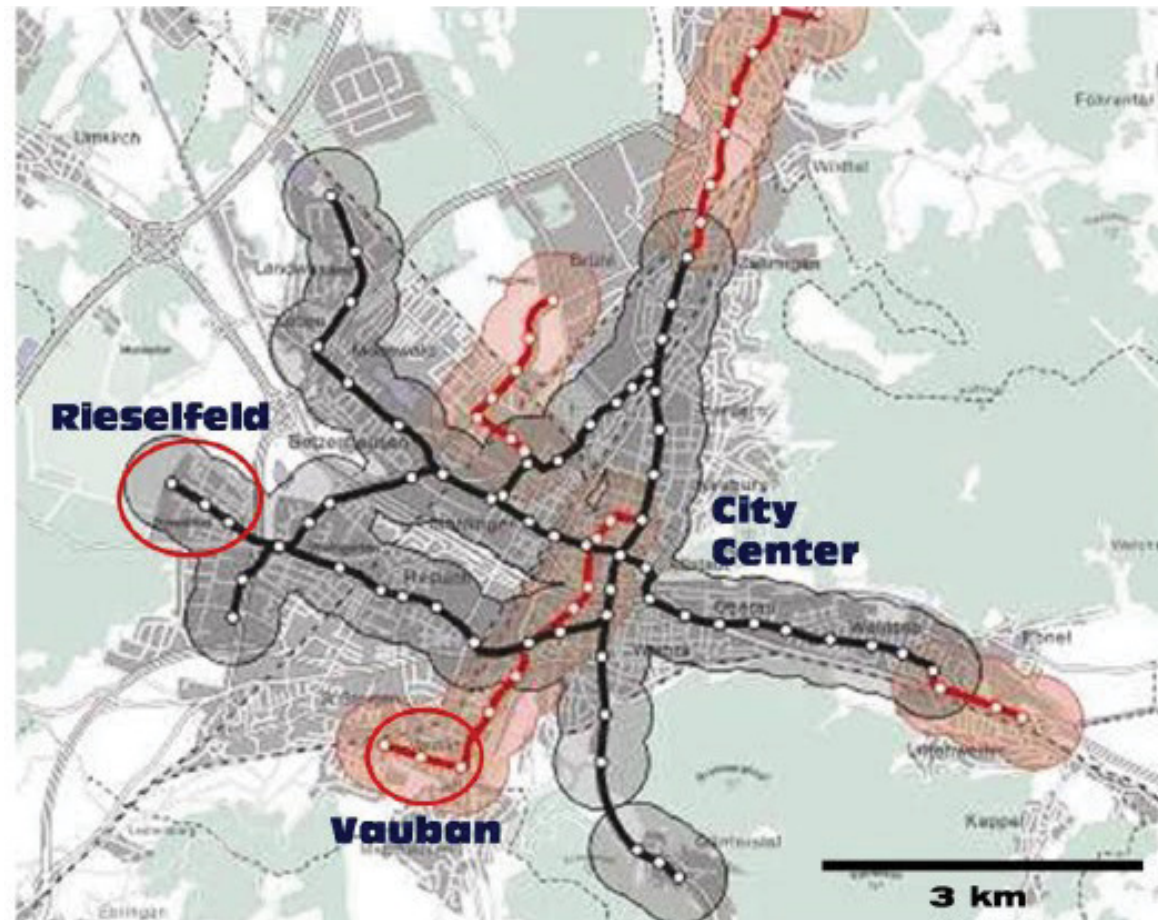
The roads were rebuilt after WW2

Accommodate a tram rather than  
more lanes for automobiles

Old streets were widened to take trams,

Tramway became backbone of the city.  
medieval center was kept car free

City owned and operated tram system



# MOBILITY

Pvt Car Only

50% car access/ mix  
bike/transit

Bikes/ Transit

“Excellent travel to the surrounding areas through excellent connections through rail” -Beatley



Started in 1972  
100% renewable energy

Regional railway system

30 km of tramway

70% of the population lives within 500 meters of a tram stop

Arrives every 7.5 minutes/ every 4 min during rush hour

City wide environmental card for travel

18% trips made on public transit

Future

Tram is the city's backbone and will continue to extend over the next decade. city council has already approved plans to connect a higher percentage of the population to a light rail beyond the 70%



# MOBILITY

Pvt Car Only

50% car access/ mix  
bike/transit

Bikes/ Transit

“Sustainable transportation planning puts biking and pedestrians on equal footing with cars” -Beatley

Gives preference to environment-friendly modes of transport;  
walking, cycling, and public transit

158 km of bus routes

400 km of cycle paths

9000 bicycle parking spaces

Some streets require automobiles to travel as fast as pedestrians

Children allowed to play in streets

250 vehicles per 1000 people in Vauban neighborhood

Biking is a convenient way of getting around Frieburg;

Lots of streets and sidewalks have dedicated bike lanes.

Many citizens use bike as main transportation.

Bikes can be rented at various shops.

Like most European cities car use are limited and  
bike riders must walk their bikes

27% trips made biking



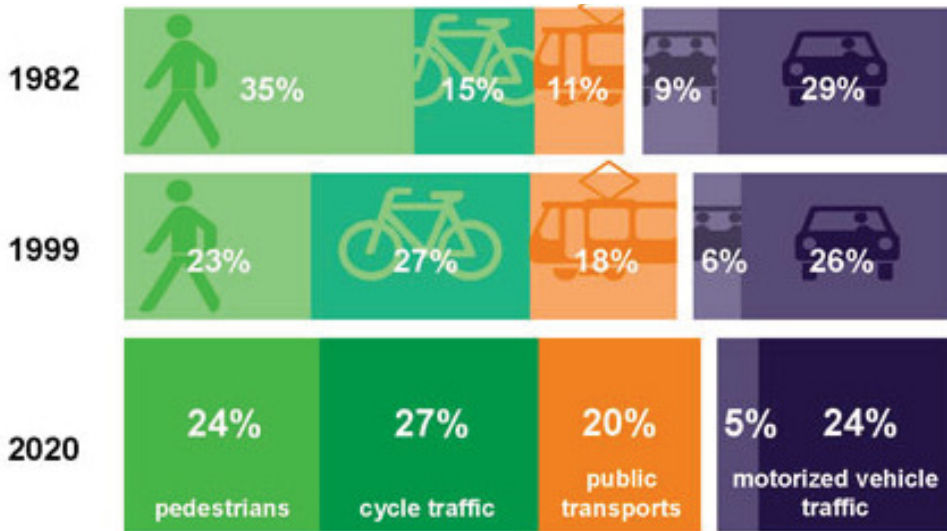
# WALKABILITY

Ped Barriers

50% car access/ mix  
bike/transit

Ped. Friendly

“Walka Walka”



1970 pedestrianizing the city center started the trend toward a pedestrian and bike friendly modal split.

Important sites are located close to each other in the inner city. Getting across the inner city can take about 10-15 min on foot.

23% trips made walking

Inner city no cars



# Biophilia

Brownfield

Barren Hardscape

some mixed green scape  
w/ building scape

Park/network

Quality rich open spaces are important factors for Freiburgs cultural, historical and aesthetic identity.

Idea of small plots with a high population density, a garden was essential for every four or five plots .

50% green space/park/nature

Freiburg has placed protection on open space, black forest, dreisam creek, rhine river valley.

Carefully defined urban boundaries  
Surrounding rural landscape of the black forest,  
Penetrates the heart of the city





# Biophilia

Brownfield

Barren Hardscape

some mixed green scape  
w/ building scape

Park/network

Under German law;  
Local authorities can place private lands in  
Agricultural and forested areas into categories as;  
Nature parks, landscape protection areas,  
or nature reserves

Water- several policies and incentives throughout the city  
have led to the application of such techniques;  
green roofs, bioswales, stormwater management  
promote natural permeable surfaces.

5,000 hectares of forest  
600 hectares of parks



# Carbon/Energy

Wastefulness

Incentives

Pro-Planet

“With the idea of nuclear power off the agenda, found themselves with a problem: a finite amount of electricity, but growing population. the solution, the people to come up with an energy saving plan to conserve existing resources.” -Beatley

1992 city developed its 1st long term energy plan.  
energy conservation, renewable energy, development of environmentally friendly technologies and transportation formed 3 pillars

- Energy saving
- Efficient technology
- Renewable energy

City exposure to 1700 hours of sunshine per year

Use of turbine wind farms  
not allowed to spin very fast due to animals

Lots of energy saving houses, few passive houses however

Germany law  
States that every new house built must waste no more than 75 kWh/m<sup>2</sup> per year, but in Freiburg its around 55 to 60

Many houses about 50% covered roofs.  
Though most homes are supplied by a small local power station, but the energy feed back into the regional grid to make their owners a modest income.



# Carbon/Energy

Wastefulness

Incentives

Pro-Planet

In 2010 Freiburg produced more than 15 megawatts of solar.  
Collectors feed more energy into the grid than they waste.

City relies on advanced energy efficient buildings;  
Passive homes-

Primary energy consumption cannot exceed 15 kw/h/m<sup>2</sup>

Biomass

16.6 million kWh/year

Largest share of renewable electricity

Woodchips are main source

Renewable energy production is encouraged  
tax credits from the federal government  
subsidies from the regional utility



# Carbon/Energy

Wastefulness

Incentives

Pro-Planet

Successful in the fields;  
renewable energy research and marketing, solar panels can be found on the roofs of the stadium, city hall, schools, churches, private houses, facades and towers. wind turbines rise from the black forest.

1996 municipal council decided to reduce CO2 emissions by 25% before 2010.  
power was reduced by over half, from 60 to less than 30%. almost 50% of the cities electricity is generated by combined heating and power plants.

2007 40% less CO2 by 2030

CO2 diet-- gives interested citizens an easy tool to calculate their own climate balance so they can determine their own share CO2 emissions

The heliotrope, worlds first energy selfsustaining solar building. zero energy houses of the bauban neighborhood



# Metabolism

Throughput

Closed loop

## Energy Saving

In 1992, all new housing must use no more than 65 kilowatt-hours of heating per sq. meter.(75 national standard)

In 2009, new housing were set to 15 KWh per sq meter

80-90% reduction in energy consumption

## Efficient Technology

CHP plants(combined heat and power)

Captures waste heat from electricity production to generate more electricity and heat

Makes up 50% of power supply

104 plants

Use landfill gas as fuel

Natural gas, biogas, geothermal, and wood chips provide fuel as well

Solar

400 photovoltaic installations in the city

15,000 sq meters of cells

Produce 10 million kWh/year

Wind

Not ideal for wind

Five windmills on hill tops

Waste management

70% of the country's waste is recovered and reused

Landfills fell from 50,000 to 200 since 1970

# Metabolism

Throughput

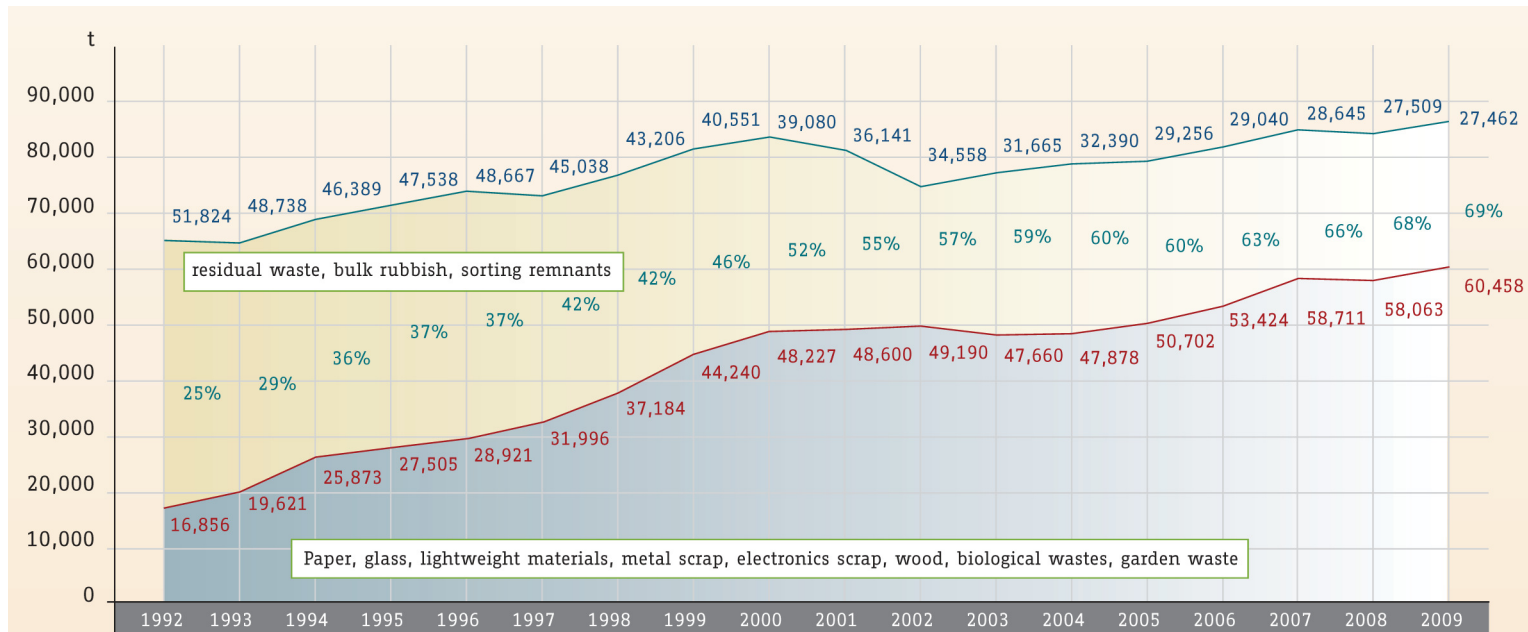
Closed loop

Water- several policies and incentives throughout the city have led to the application of such techniques as green roofs, bioswales, other stormwater management features to promote natural, permeable surfaces.

Citizens are doing their best to keep it a sustainable city. recycling paper, plastics, organic material has been taken up by those living there

The city recycles 80% of the paper used introduced in 1991

Since 2005 non recyclable waste from the region is incinerated at a plant in the industrial park Breisgau, the plant practices safe waste disposal. It supplies energy to 25,000 households. energy generated from the fermentation of the bioorganic wastes covers one percent of Freiburg energy demand



# Governance

Selfishness

Top-Down

Cooperation

## World War 2

Over 85% of the innercity was destroyed.  
Preservation and protection of the city;  
history, culture and architecture took action.

Neighborhoods were developed and built according to the  
“Idea of sustainability.”

In 1995, would only permit construction only of :  
Low-energy buildings on municipal land  
All new buildings must comply



Part of Freiburg quest to be one of the greenest cities in the world, helped by the fact that world war 2 most of the city was leveled. and rebuilt on energy saving principal

Scale. limited heights of new buildings;

Idea- parents shout from top floors to kids and hear reply  
Important to get in touch with the ground  
To reduce theft small garages (for those who wanted cars)  
Were built every two blocks, than large ones every five blocks

Preserved use of traditional material into buildings and streets.

Freiburg has placed protection on;

Open space, black forest, dreisam creek, rhine river valley.  
Defined urban boundaries mesh with rural landscape of  
Black forest, which also penetrates the heart of the city







# Planning

No Plan B

Future Goals

Plan Fulfillment

Land use plan 2020- was agreed in 2006, committed to reducing land use as far possible and includes about 30 hectares less building space than was previously available. Valuable living space for humans and animals will be extended and combined into a citywide biotope association by means of targeted nature conservation measures

“Unique combination of topography, climate, leadership, and history have merged it a pioneer in renewable energy, nature protection, transportation, & environmental planning. Vibrant public transportation & environmental planning. Renewable energy industries, clearly defined landscape plans & urban forests, & environmentally designed housing projects in neighborhoods in Riesfeld, wiehre bahnhof, vauban reflect how environmental protection, economic growth, social inclusion are interrelated.” -Beatley

Focused on the infill and transit oriented development

“The redevelopment and focus on commercial, ecological, and social interlinkages led to creation of the planning term fresh cell therapy.”

$\frac{3}{4}$  of yearly growth of wood is harvested

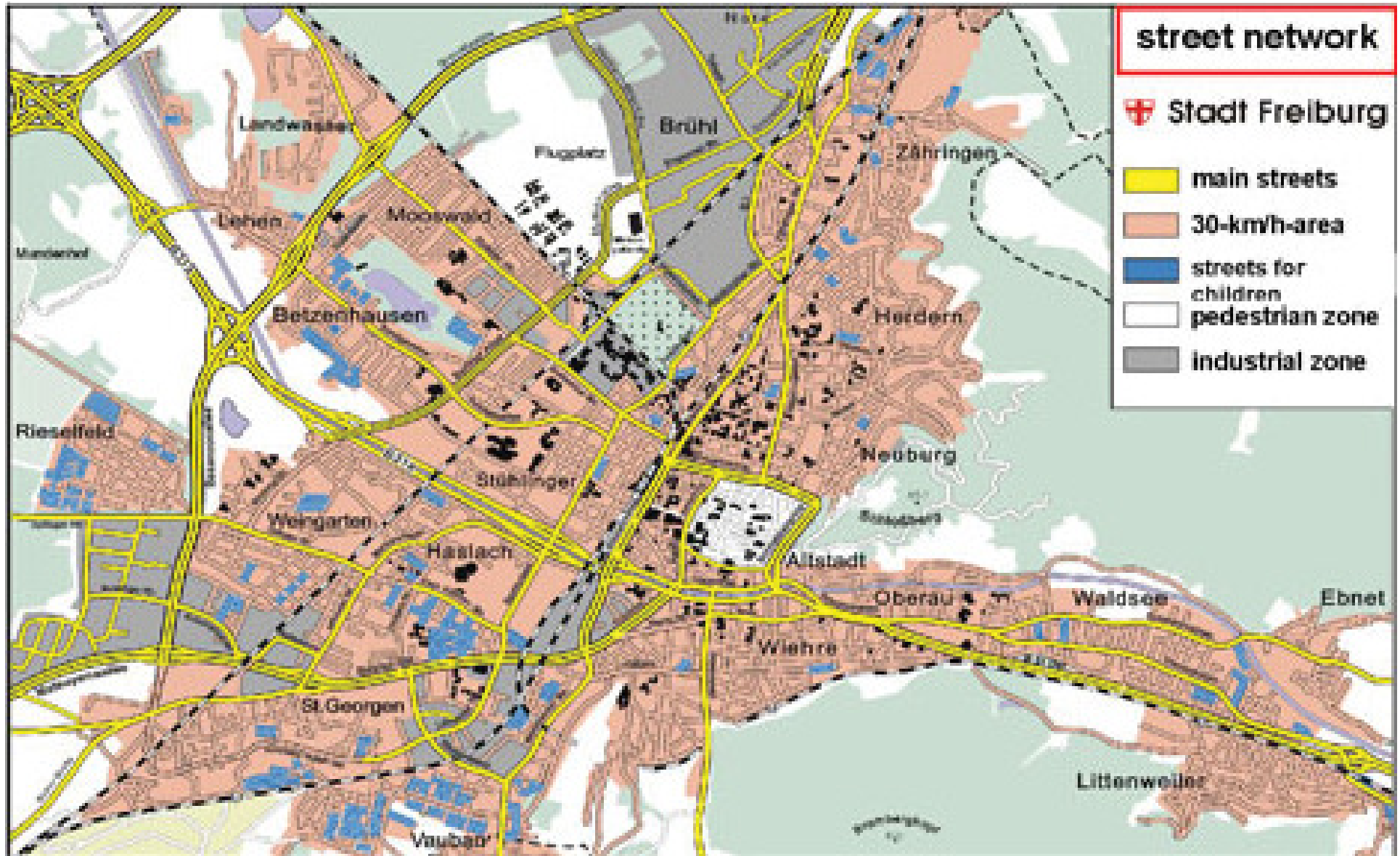


# Planning

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Plan Fulfillment



# Culture

Denied

Visible

Celebrated

Freiburg Eco-station is the environmental education Centre of the region. Every year about 15,000 visitors attend over 600 events in the low-energy building in the t seepark

The freiburger barockorchester and ensemble recherché, which is dedicated to contemporary music, rank among the best of their kind in the world

The longest cable car in Germany

System of gutters(Bachle) that run providing water to fight fires and feed livestock

In the summer they provide passive cooling

Nuclear plant was to be built in a neighboring town, Freiburg residents protest the proposed plant and succeeded

Citizens are doing there best to keep it a sustainable city. recycling paper, plastics, organic material has been taken up by those living there

Tours

Primary factors such as the citizens high levels of environmental awareness, political priorities and targeted economic development.

Freiburg has gained a worldwide reputation in such fields as solar engineering, traffic policy, enviromental and climate protection.

The university has developed into a modern future workshop, where innovative and undogmatic concepts that reconcile

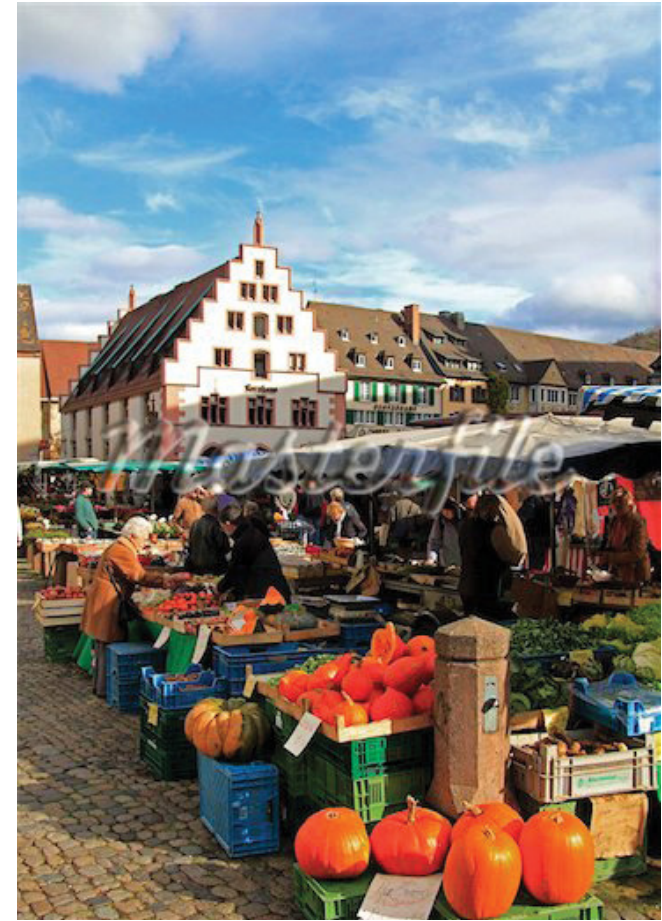
The art of living with sustainability, ecology with economy are in evidence at every turn.

# Culture

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# Metabolism

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# Governance

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# Planning

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# Culture

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