

**2013 Esri Europe, Middle East and Africa  
User Conference**

October 23-25, 2013 | Munich, Germany

**Using ArcGIS Web  
Applications to Manage  
Electric Power Grids in TINETZ**

Reinhold Schnizer

TINETZ (formerly TIWAG Netz AG)

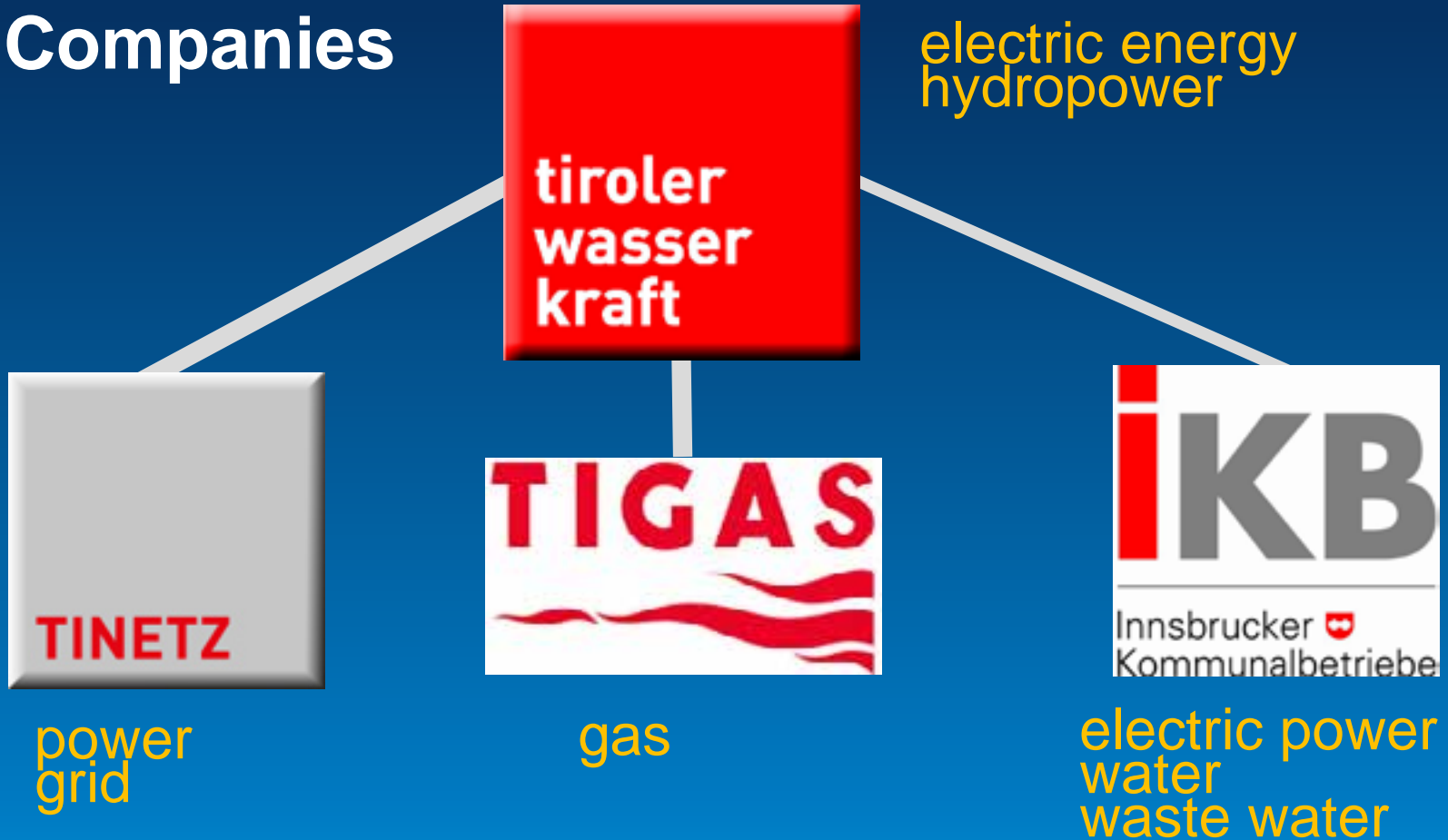
Tyrol Austria

# presentation content



- Companies
- use case 1
- solution
- use case 2
- Experiences

# Companies



350.000 customers  
2.000 employees

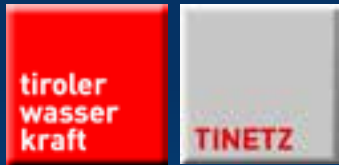
# Companies



50 ArcEditor, 6 cores ArcGIS Server, 4 cores DB



# use case 1: new customer



**use case 1: new customer**

**electric power ?**



# use case 1: new customer

contract





# use case 1: new customer

new distributor



**2 weeks later**



# use case 1: new customer

power off

dark ?

D-Day

# use case 1: new customer

power off



**D-Day**



# use case 1: new customer

split cable

power is off ?

D-Day



# use case 1: new customer

light !



**D-Day**

# Solution



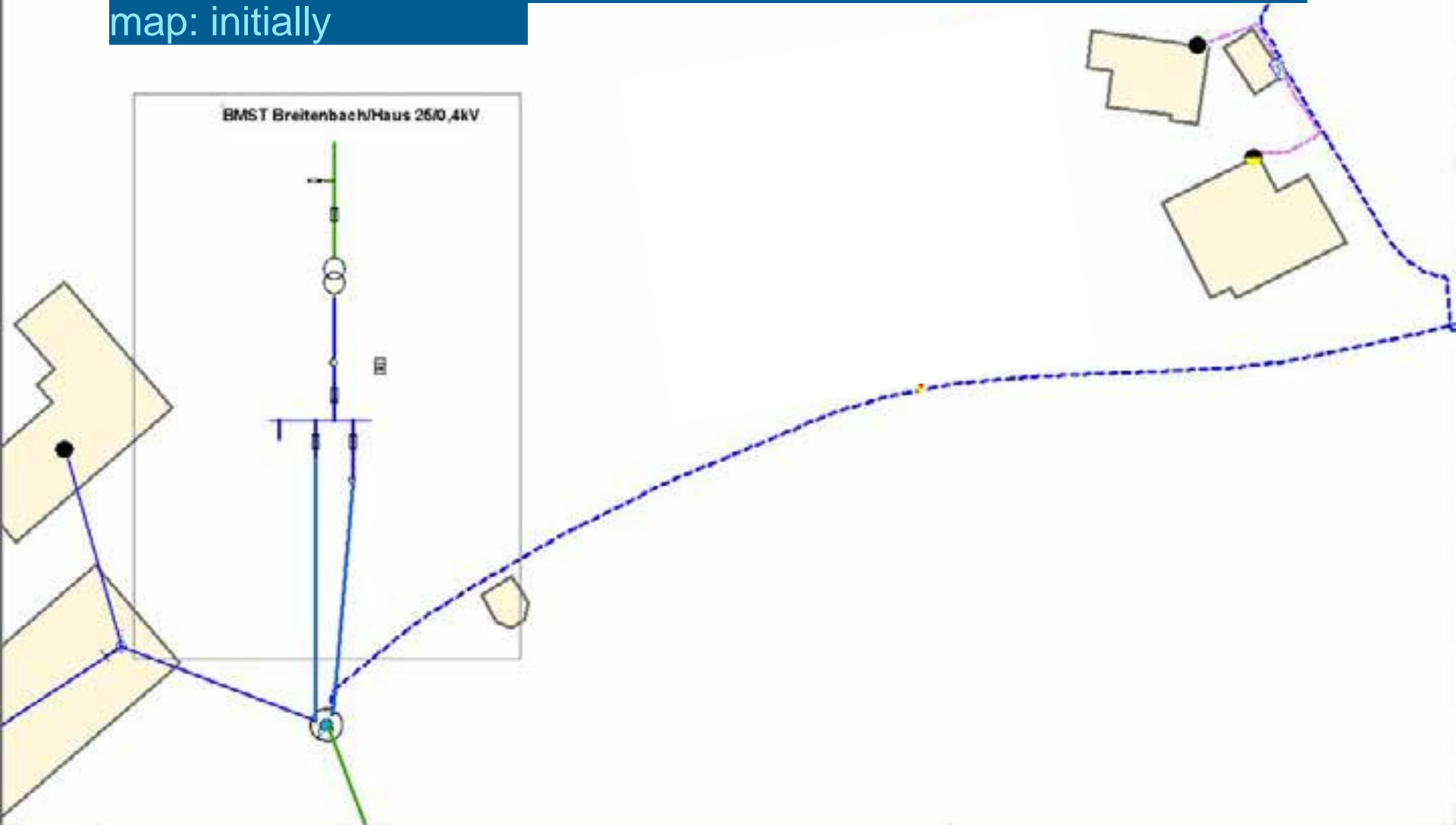
new Web Application

“switch management”

to handle all planned switch offs

# Solution for use case 1: new customer

map: initially





# Solution for use case 1: new customer

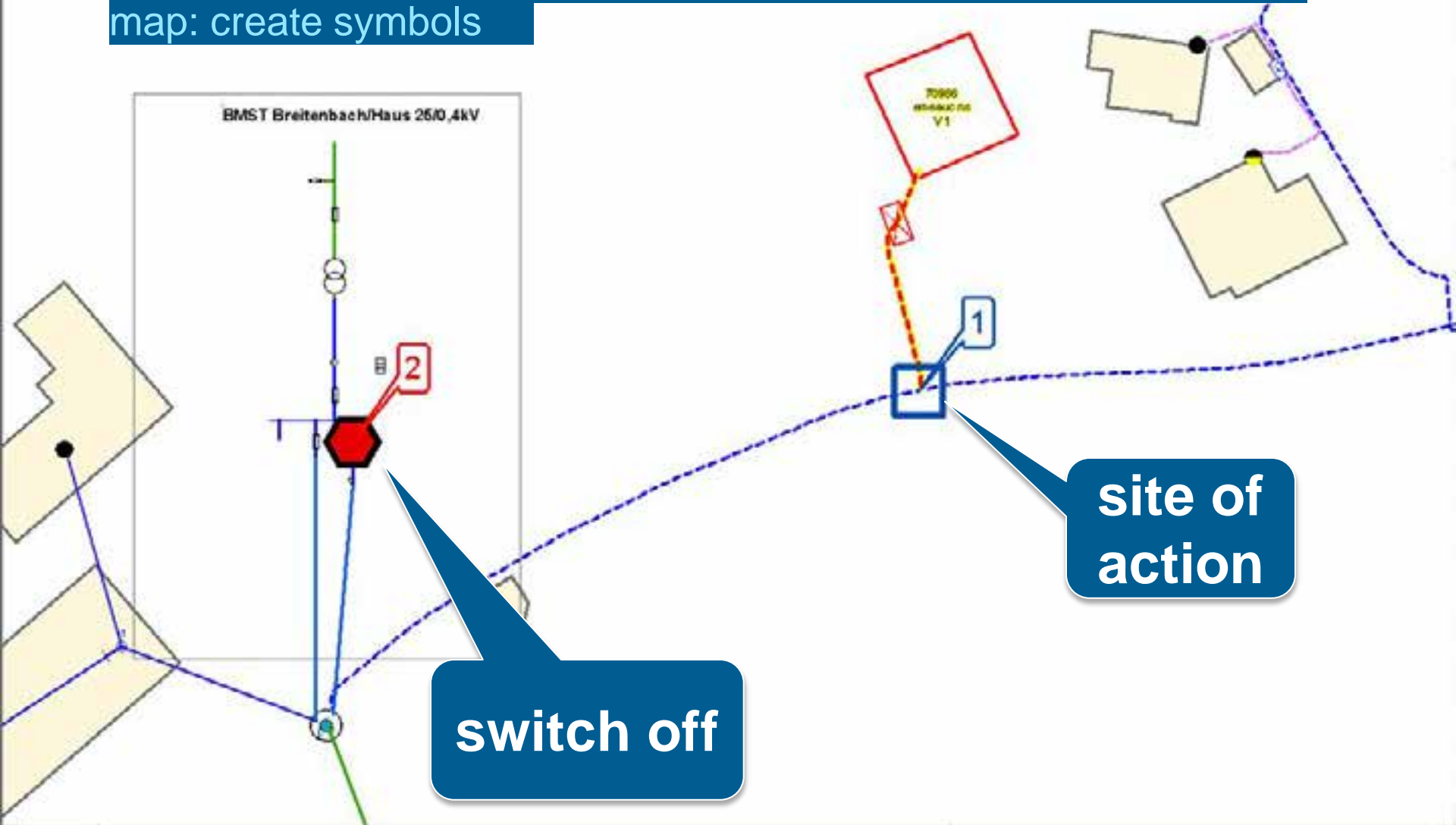
map: projected



**projected  
new house**

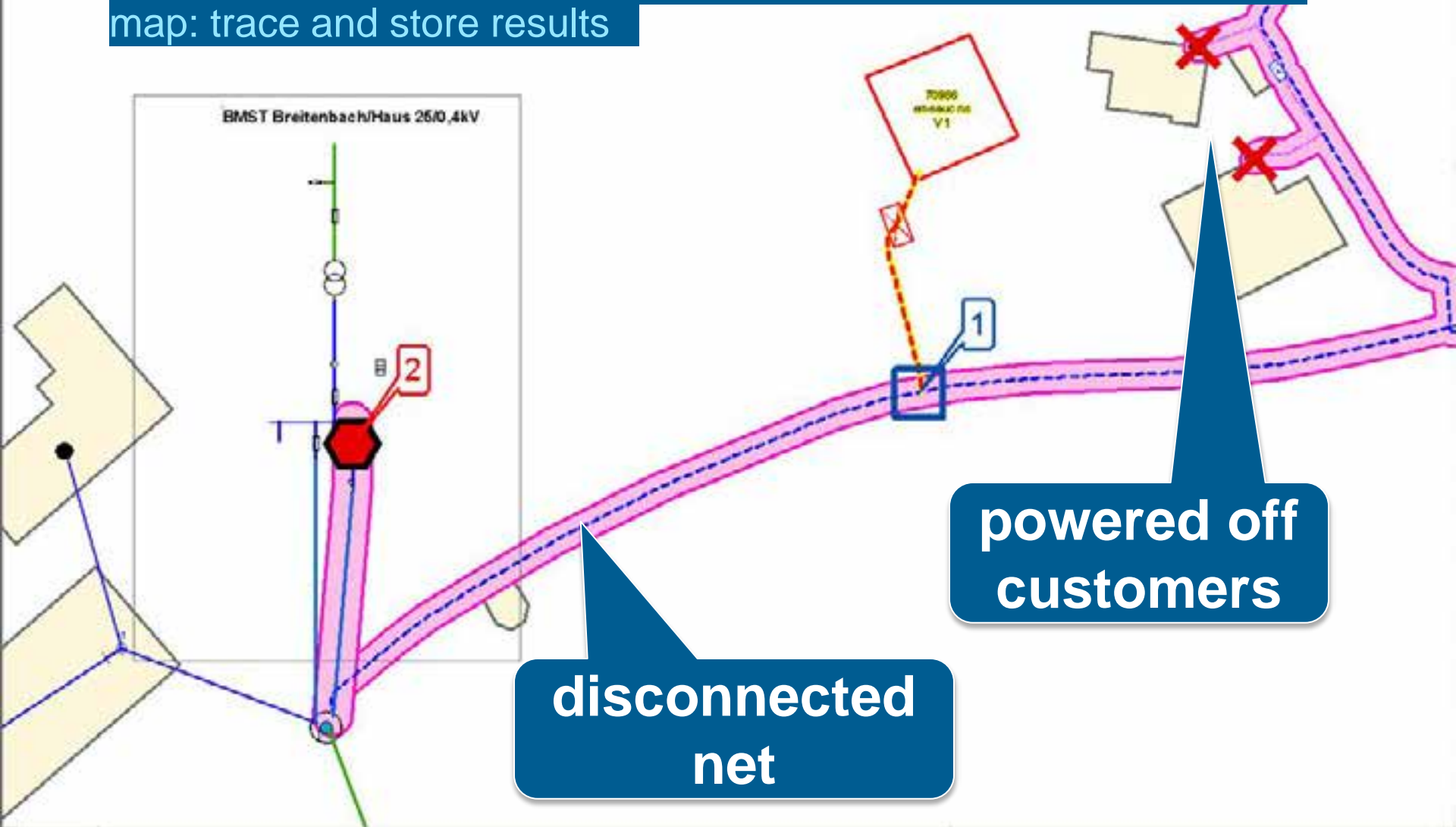
# Solution for use case 1: new customer

map: create symbols



# Solution for use case 1: new customer

map: trace and store results



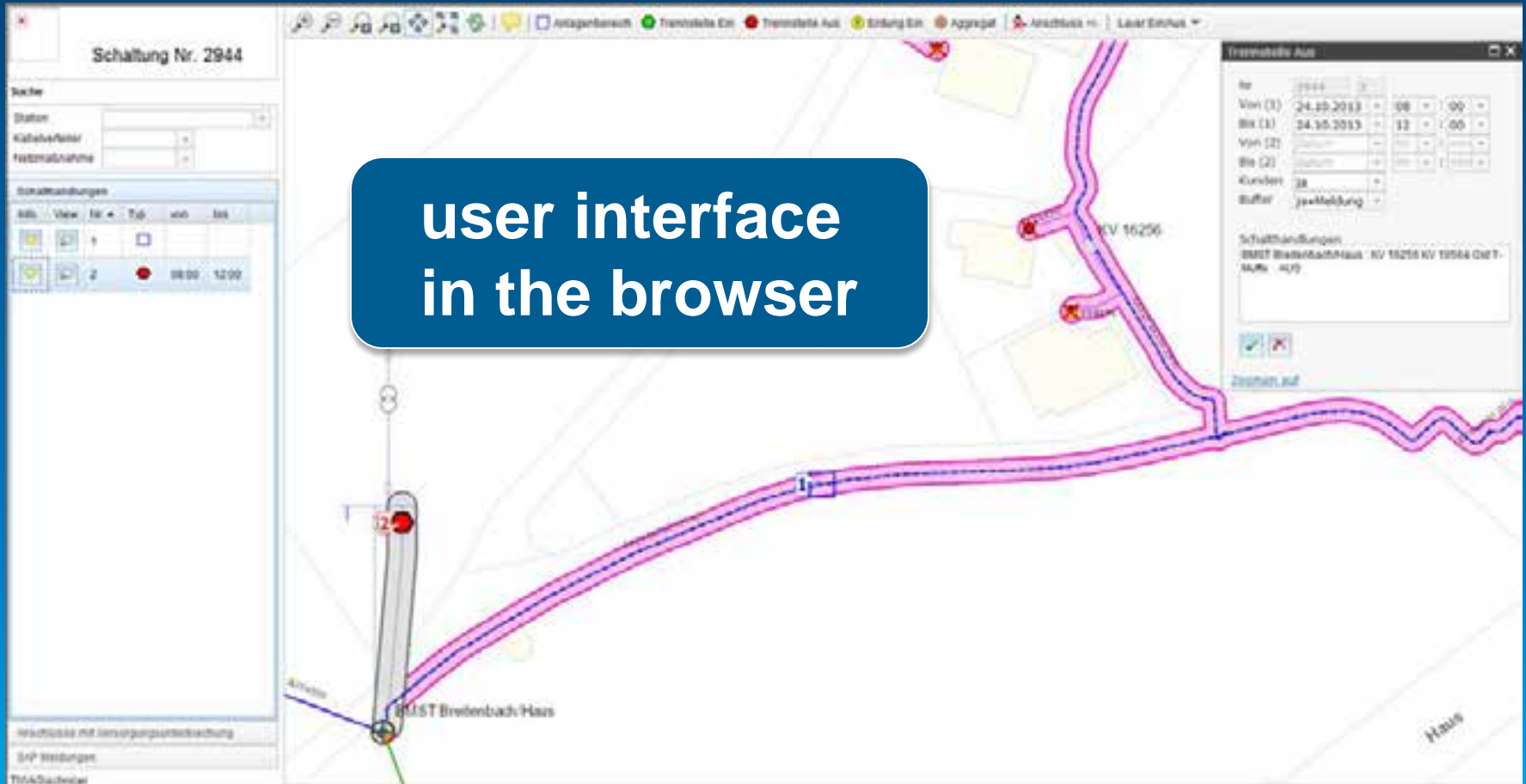
**disconnected  
net**

**powered off  
customers**

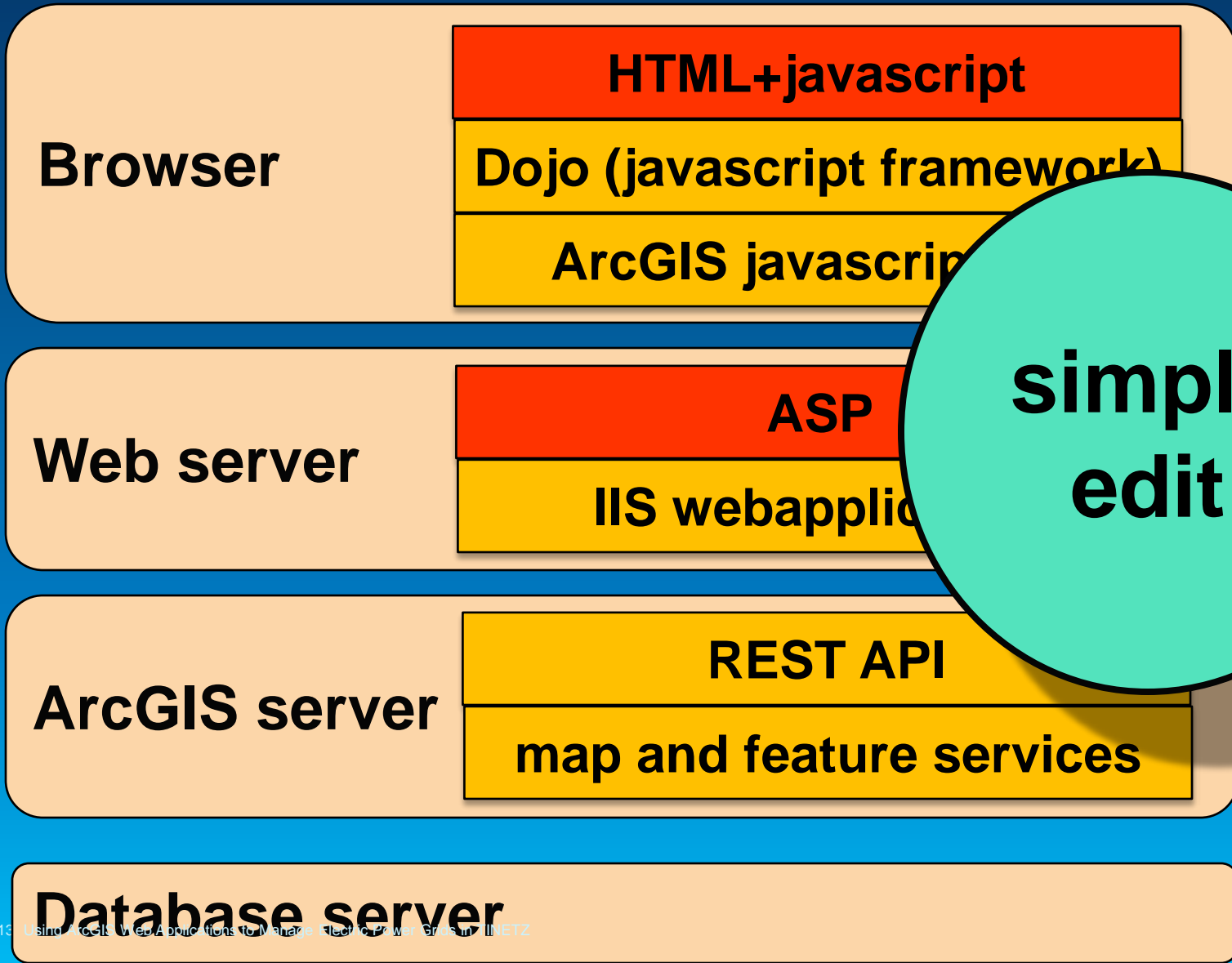


# Solution for use case 1: new customer

web application frontend

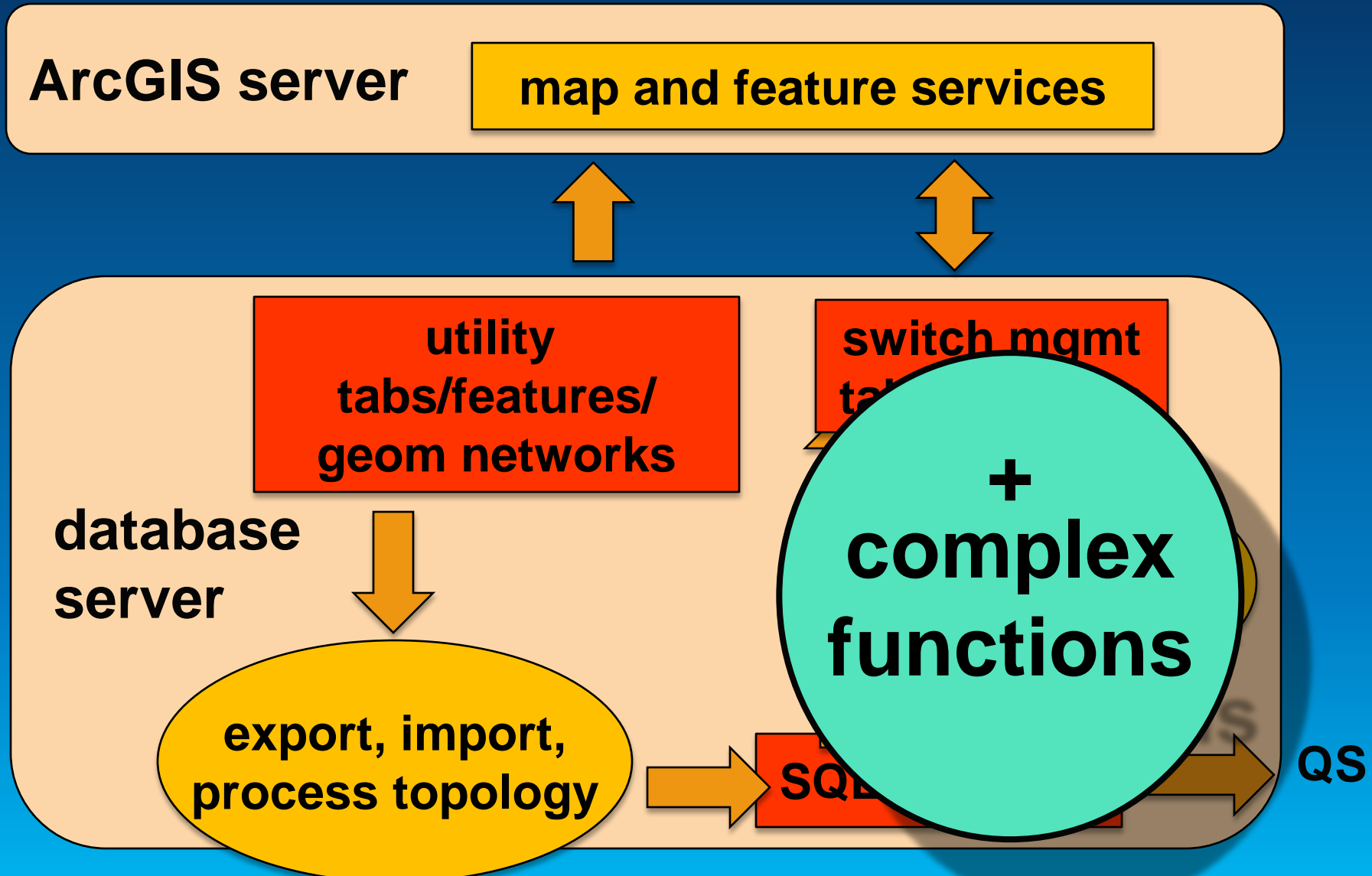


# switch management system architecture



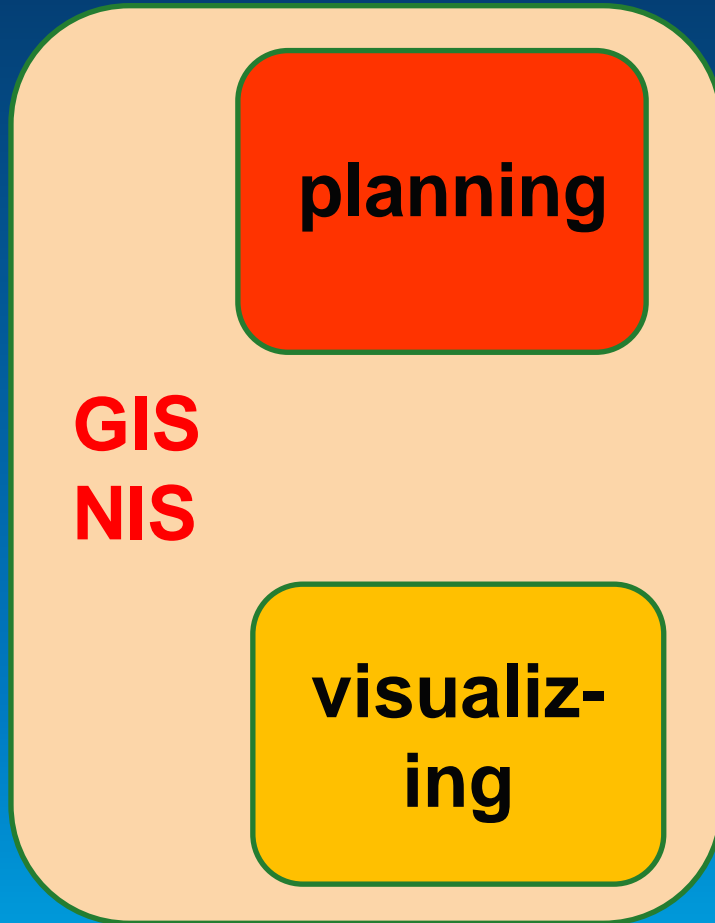
**simple  
edit**

# switch management system architecture





# switch management application context



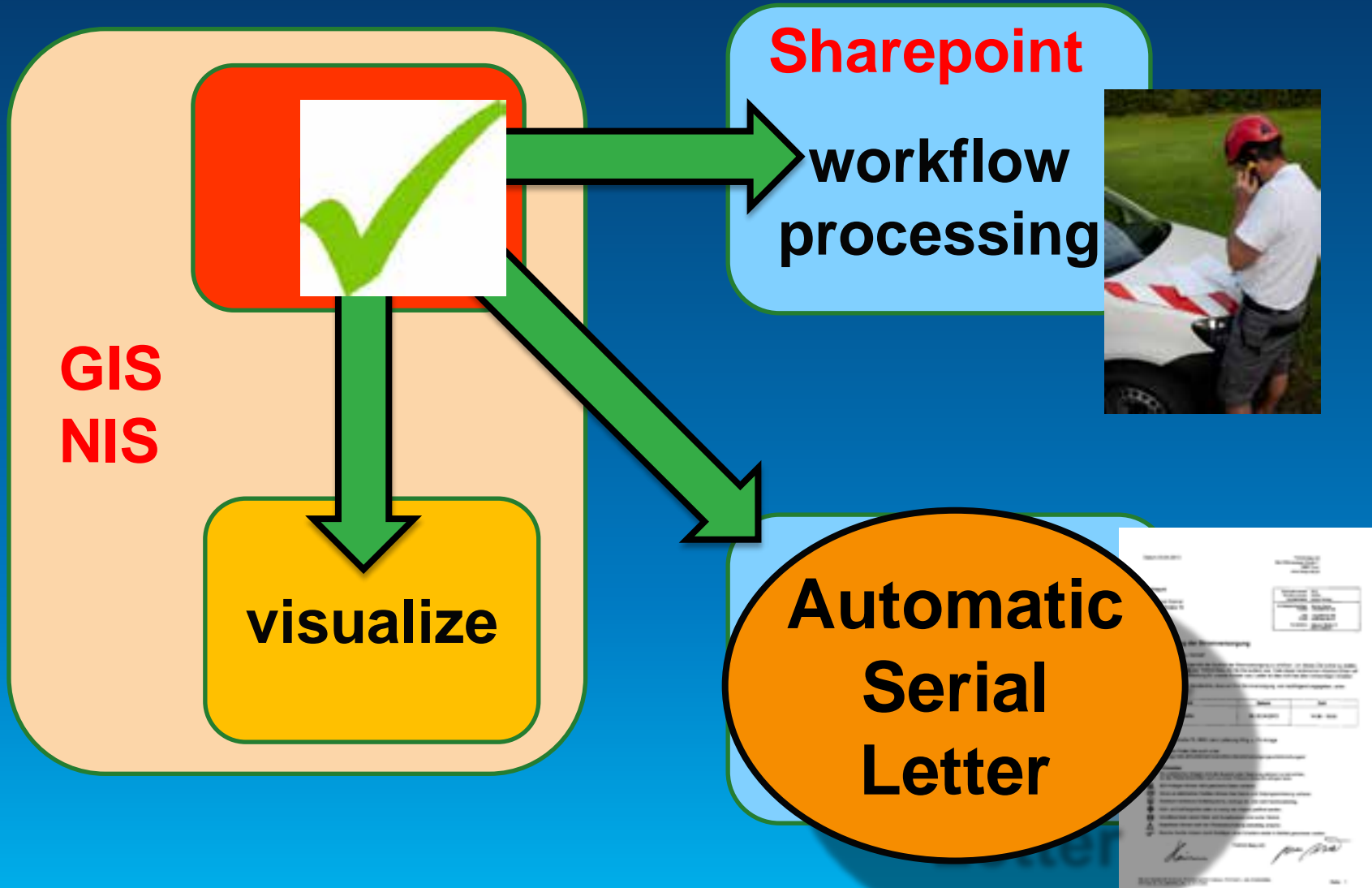
**Sharepoint**

**workflow**

**SAP**

**customer information**

# switch management application context



# use case 2: high voltage switch off



## use case 2: high voltage switch off





# use case 2: high voltage switch off

narrow mountain valley

only one  
distribution  
line

energy

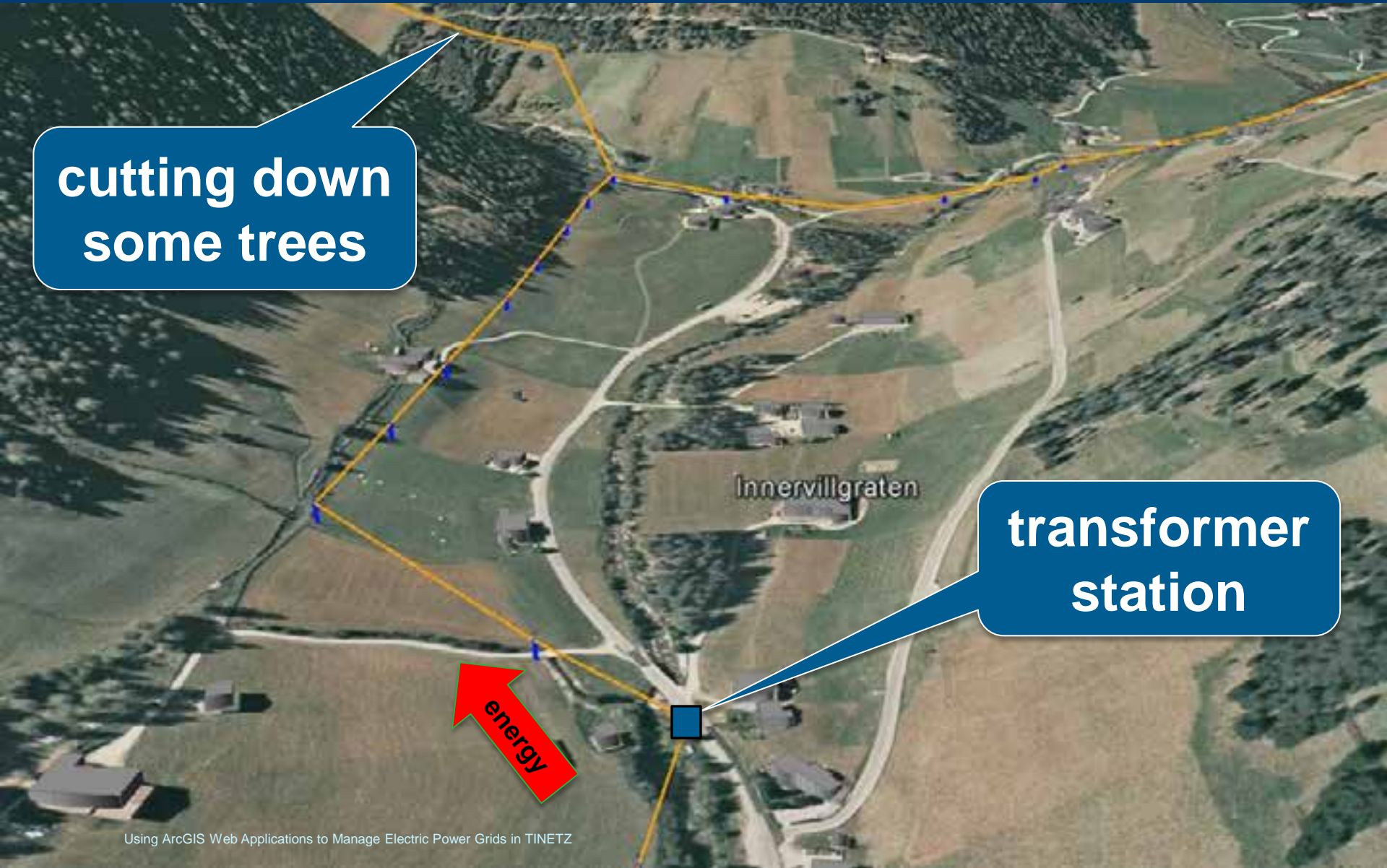


## use case 2: high voltage switch off

cutting down  
some trees

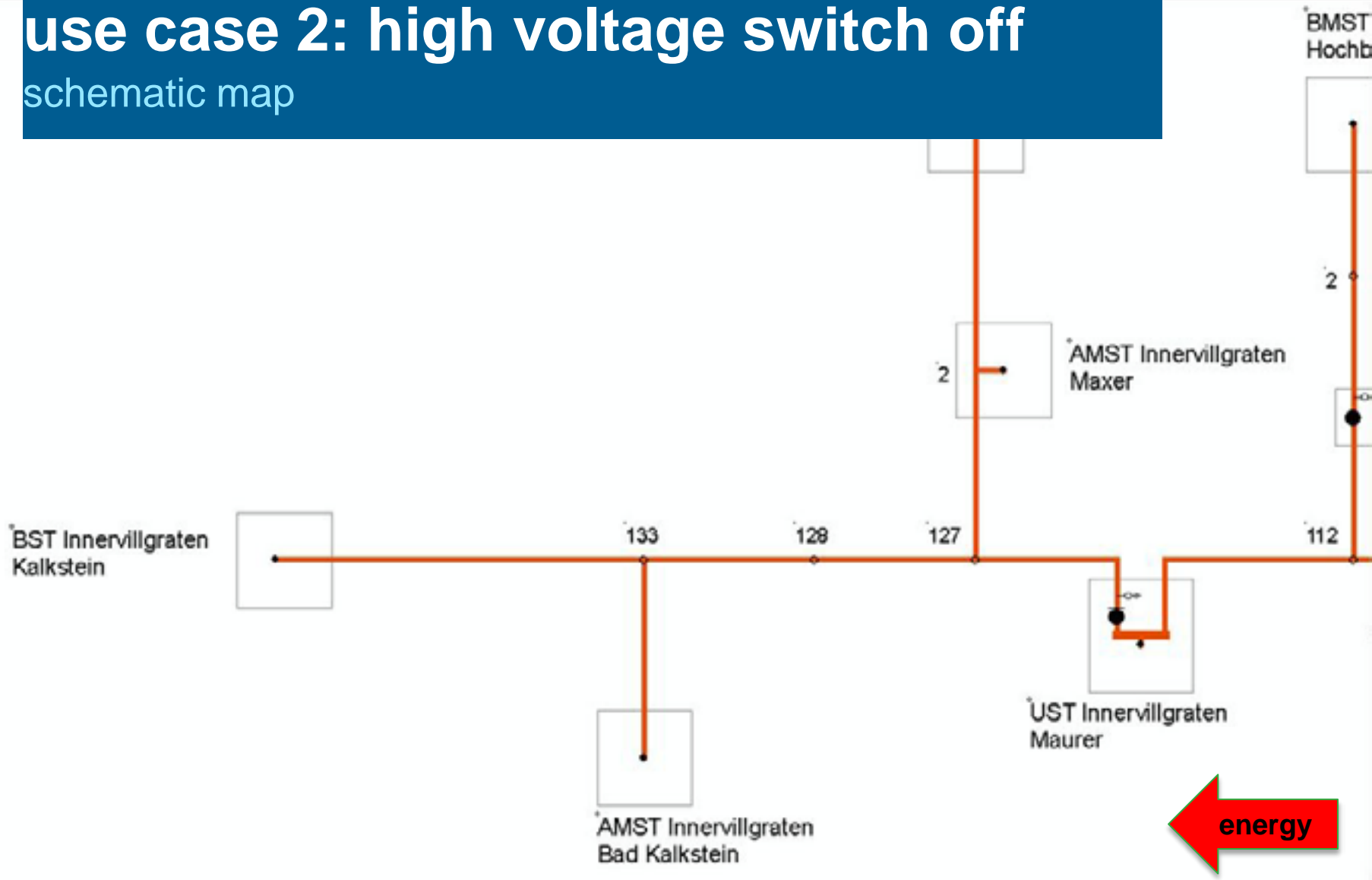
transformer  
station

energy



# use case 2: high voltage switch off

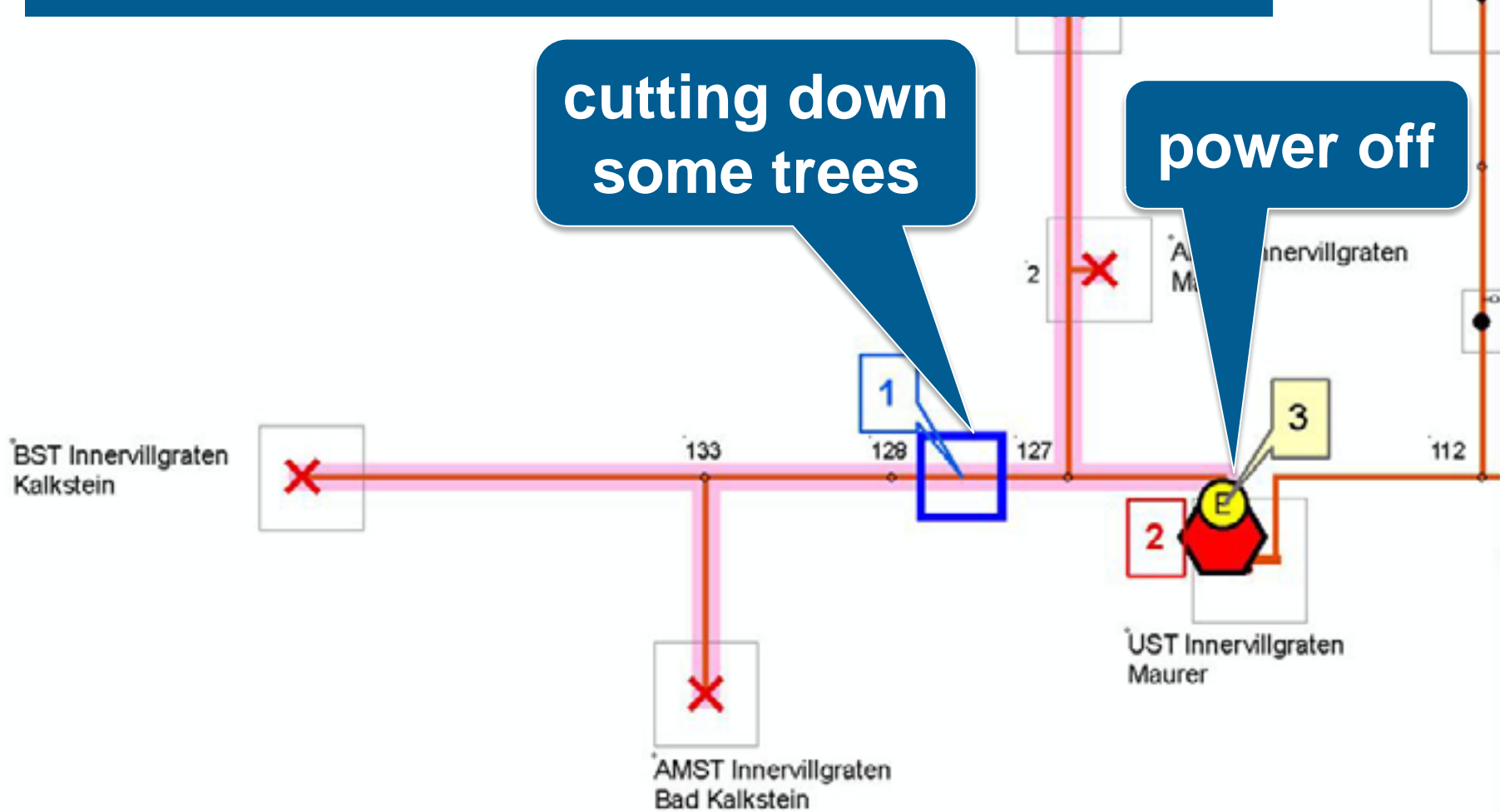
## schematic map





# use case 2: high voltage switch off

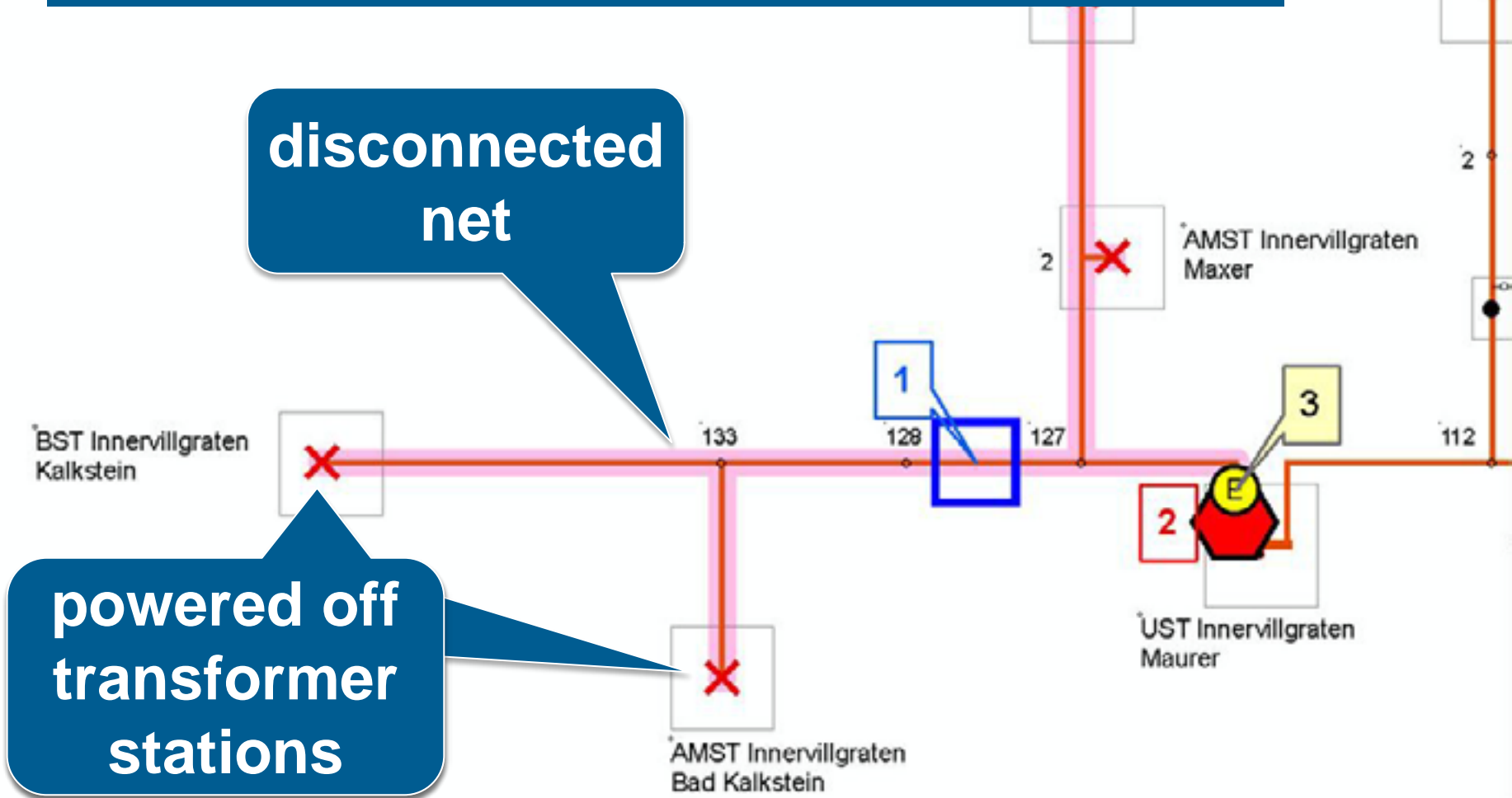
schematic map after entering symbols





# use case 2: high voltage switch off

schematic map after entering symbols



## use case 2: high voltage switch off

geografic map after entering symbols in schematic map

**disconnected  
net**

**powered off  
customers**

## use case 2: high voltage switch off

intersection of additional maintenance tasks in geographic map

cutting down  
some trees

repair poles



# use case 2: high voltage switch off repair poles





# use case 2: high voltage switch off repair poles



# experiences of switch management



# experiences of switch management

statistics after **six** months production



- 52.000 customers affected and informed
- 1.100 planned switch offs
  - 5.700 switching actions
  - up to 30 actions in 1 switch off
  - up to 1600 customers in 1 switch off
  - 20 different reasons
- 30 users entered these switch offs
- mean edit response time in web app 3 secs

# experiences of switch management

## benefits



- saving of labor
- less disconnection time for our customers
- well documented customer information
- higher quality of planning



# experiences of switch management

## benefits

- saving of labor
- less disconnection time for our customers
- well documented customer information
- higher quality of planning

## precondition

- higher quality of information by check of connectivity from customers to transformers (99.7 %)  
automatic traces of 4.000 isolated subnets are needed every night

# experiences of switch management

experiences



- happy users
- challenging and motivating technology

# wishes to ESRI



- robust and fast multi user editing of network features
- updating network weights in web applications
- read access to network topology by SQL and Python
- trace in REST API

**utility network  
is essential**