RE2TN

Renewable Energy to (2) Tamil Nadu

Smart Cities in Tamil Nadu

Venue: Raintree Hotel,
120, St. Mary's Road, Austin Nagar,
Alwarpet, Chennai- 600018

Date: November 24, 2016

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On the path to Post Carbon Economy

Smart Cities in Tamil Nadu

Thursday, November 24, 2016	
09:30 - 10:00	Registration
10:00 - 10:05	Welcome Address & Overview of Presentations Ms. Lumine Divya, Project Lead – Stadtwerke Gandhigram, iPLON India Private Ltd
10:05 - 10:30	Germany's commitment to Climate protection and Smart Cities in Tamil Nadu – Chennai & Coimbatore Mr. Achim Fabig, Consulate General of Germany, Chennai
10:30 - 11:00	Philosophy and Strategy of Stadtwerke (Multi-utility Company) and the German Indian Platform Mr. Abhijit Singh Sachdeva, International sales iPLON Germany / Director iPLON India
11:00- 11:30	Status of "Smart City": Chennai and Coimbatore Mr. Alfred Vinod Antony, CEO, Progen Energy Solutions
11:30 -12:00	Coffee Break & Networking
12:00 - 12:30	Best Practices followed in Smart City Schwaebisch Hall for Climate Protection/ CO_2 reduction Mr. Abhijit Singh Sachdeva, International sales iPLON Germany / Director iPLON India
12:30 - 13:15	Grid Stability issues in Schwaebisch Hall due to the high RE Supply Mr. Peter Breuning, Technical Director – Power Grids, Stadtwerke Schwaebisch Hall GmbH
13:15 -14:15	Lunch
14:15 -15:15	Live Demo of Smart City Schwaebisch Hall using SCADA Application - Renewable Energy - Water Management - Waste Management - E-Mobility - Air Conditioning Systems Mr. Peter Breuning, Technical Director – Power Grids, Stadtwerke Schwaebisch Hall GmbH
15:15 - 15:45	Making of "Stadtwerke Gandhigram" Dr. V. Kirubakaran, Director, Rural Energy Center, Gandhigram Rural Institute – Deemed University
15:45 - 16:15	Coffee Break & Networking
16:15 - 16:45	Water management as key factor for the success of Stadtwerke Mr. Abhijit Singh Sachdeva, International sales iPLON Germany / Director iPLON India
16:45 - 17:15	Requirements for Micro Grid at Tharangambadi Ms. Jasmin Eppert, Project Manager, Tharangambadi
17:15 – 17:20	Announcement of Next workshop Ms. Lumine Divya, Project Lead – Stadtwerke Gandhigram, iPLON India Private Ltd

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stadtwerke Schwäbisch Hall GmbH

SchwäbischHall

Gandhigram Rural Institute Deemed University

WELSPUN Dare to Commit

M+ SOLAR

Solarstromanlagen Württemberger GmbH

Solar Cluster Baden-Württemberg

iPLON® India Pvt Ltd.,

Philosophy & Strategy of Stadtwerke (Multi Utility Company)

iPLON's commitment and the German-Indian Platform

Victor Thamburaj

CEO, iPLON GmbH and iPLON India

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“Thoughts”

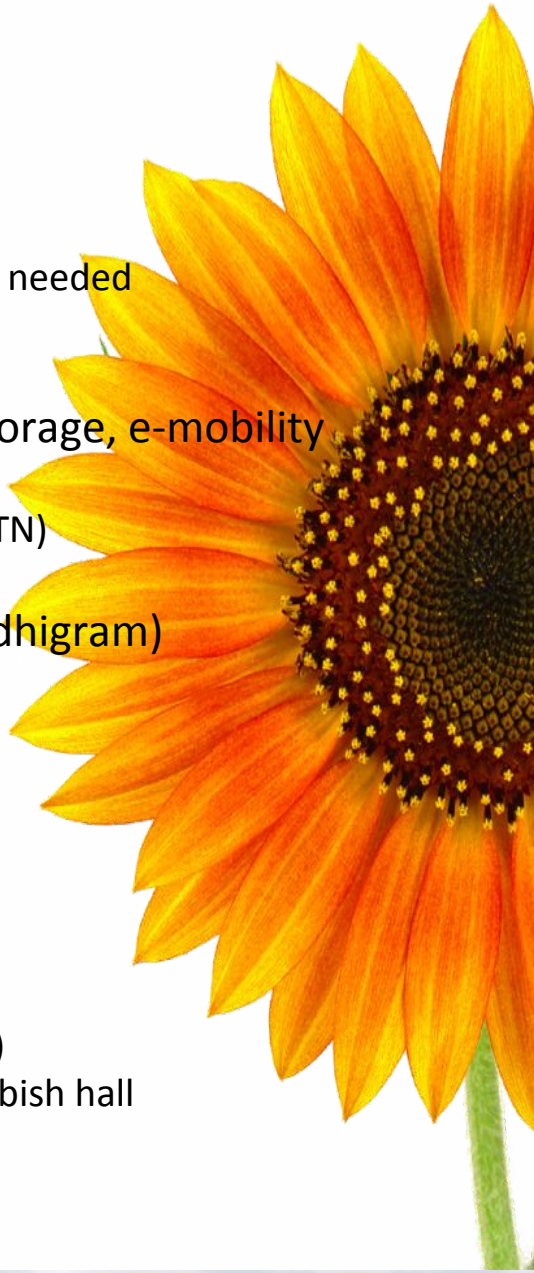
- Provision of Basic Utilities to people is the Next big Wave
  - Huge demand : (850 Million under the age of 35)
  - Energy, water, mobility, waste management and climate (Cooling) needed
  - (Stadtwerke-focus and deliverables)

- Smart city (Smarter village), RE, PV, Smart grid, Micro grid, Storage, e-mobility
  - Market for Stadtwerkes in India
  - India : 100 smart city : germany 1000 Stadtwerke (350000 jobs in TN)

- Focus on one region (Tamil Nadu, Chennai, Coimbatore, Gandhigram)
  - Dezentral: small is beautiful!

- SME-Netzwerk BW-TN makes sense !!!
  - Platform/Framework : SME in Chennai/ Tamil Nadu (re2tn.org)

- Implementation / activities
  - 2016/2017
  - Workshop Chennai / Solar Cluster in TN / Intersolar 2017 (Munich)
  - Visit 15 member team Chennai/Gandhigram to Smart City Schwaebish hall



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Basic Utilities is a municipal task

- Secure access to basic public services such as water, energy, cooling and heating as well as waste water treatment are pre-requisites for normal living standards
- Responsibility rests with the Local Community to ensure these basics for the people of the community
- Hence, this is a local task and can be best managed locally

“Stadtwerke” as a municipal company

- The municipally-owned Utility company “Stadtwerke” is an important body to guarantee these public provisions
- The local community has a direct influence on the profitability, the objective and efficiency of the local energy supply
- Coordination is handled locally (people know which door to knock to solve their problems)
- Value remains regional !!


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Wind Farm
Hydropower
Grid
Smart Company
Biogas
Electromobility
Smart Farm
Smart Comunity
Solar Farm
Smart Grid
• Solar Farm
• Wind Farm
• Biogas
• Hydropower
• Smart Comunity
• Smart Company
• Smart Farm
• Electromobility

GEMEINDE LEITSTAND + GRID STABILITÄT

(Eigen Verbrauch / e-Mobilität)

NETZBETREIBER

Netze BW

20 kV

Trafostation

DIREKT-VERMARKTER

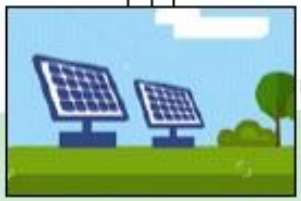
NEXT

GEMEINDE LEITSTAND

20 kV TRAFO

WIND ANLAGE

20 kV TRAFO



PV ANLAGE

20 kV TRAFO

BIOGAS ANLAGE

Why Stadtwerke (The Indian Context)?

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- The best Surfboard for the Next Big Wave!
- Because it supports creation of high quality rural jobs
- Makes use of clean and renewable energy (Grid stability issues)
- Leads to Smart Cities but Smarter VILLAGES
- Basic utilities for all (Energy and Water)
- Focusses on Decentralization leading to transparency and independence
- It is the Future of Utilities Management
- Peak Oil; Climate Change

Benchmarking Germany / Tamil Nadu

Country	Area	Per person Consump-tion	Number of Utility Companies	Population
Germany	357,021km^2	7081 kWh/year	> 800	80,767,000
Tamilnadu, India	130,058 km^2	684 kWh/year	1	72,138,958

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Where are we focussing?

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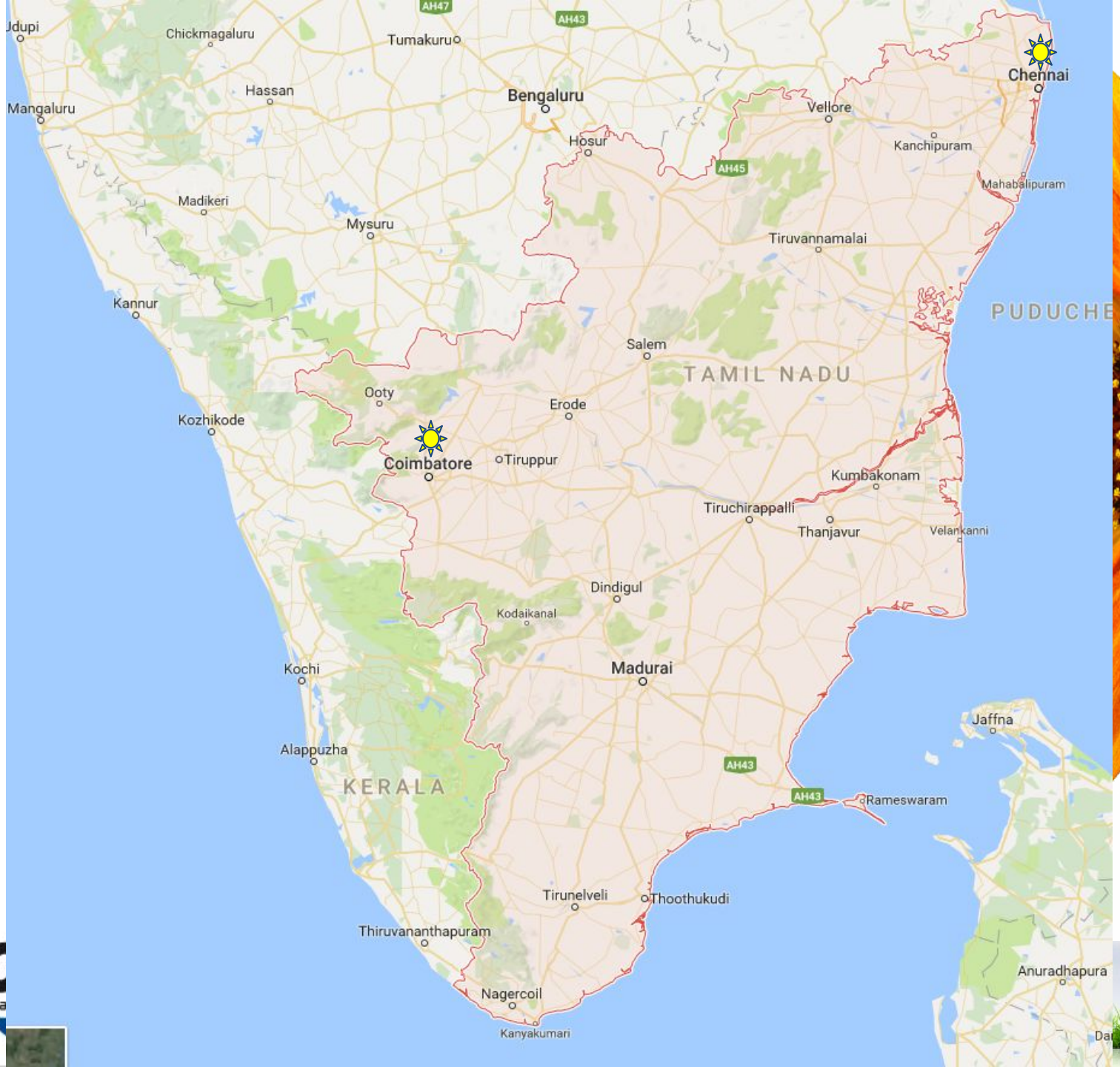
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Chickmagaluru
Tumakuru
AH47
AH43
Chennai
Hassan
Bengaluru
Mangaluru
Vellore
Hosur
Kanchipuram
AH45
Mahabalipuram
Madikeri
Mysuru
Tiruvannamalai
Kannur
PUDUCHE
Salem
TAMIL NADU
Ooty
Erode
Kozhikode
Coimbatore
Tiruppur
Kumbakonam
Tiruchirappalli
Thanjavur
Velankanni
Dindigul
Kodaikanal
Kochi
Madurai
Jaffna
Alappuzha
KERALA
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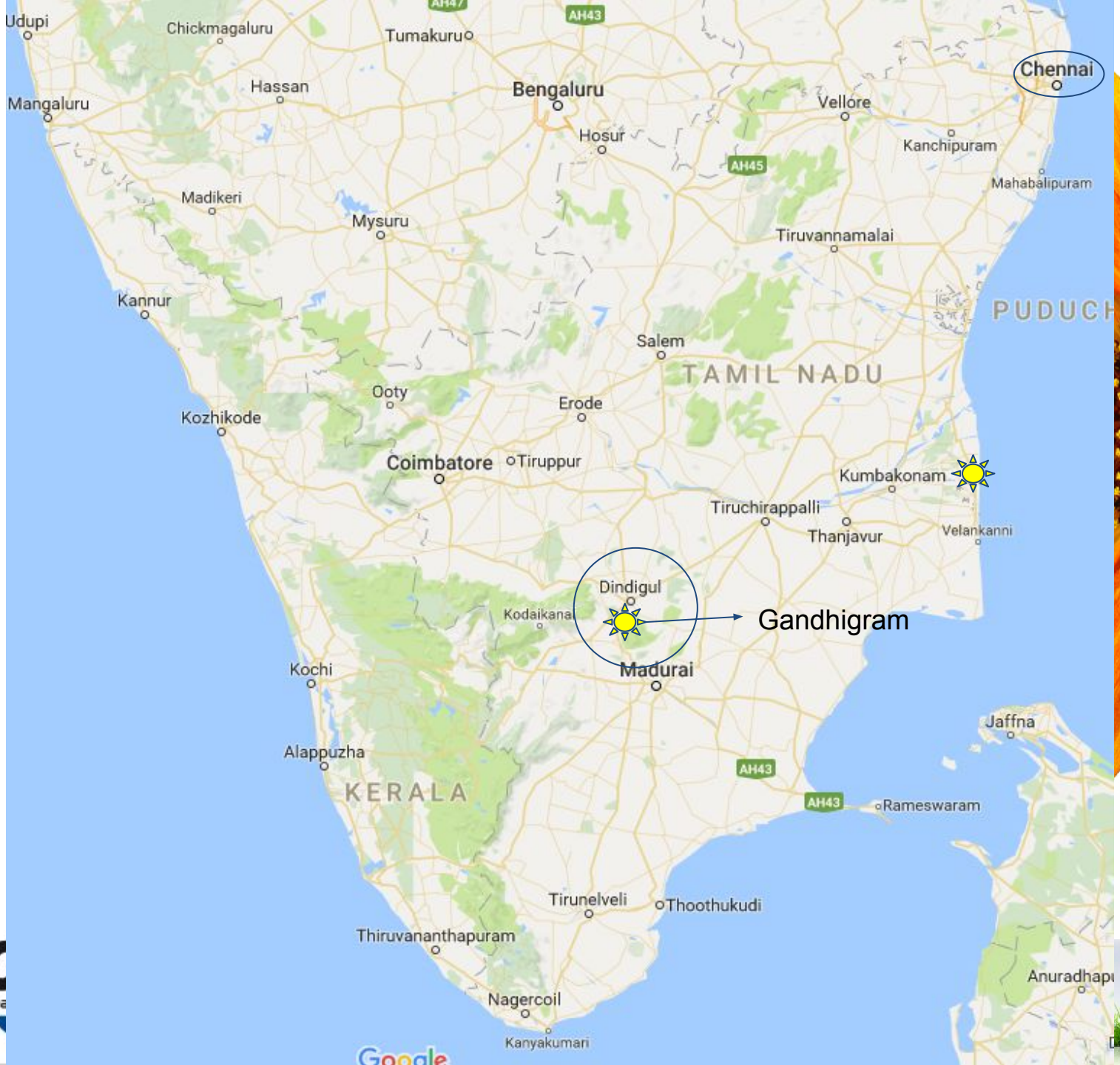
Thiruvananthapuram
Anuradhapura
Nagercoil
Kanyakumari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Mysuru
Tiruvannamalai
Kannur
PUDUCH
Salem
TAMIL NADU
Ooty
Erode
Kozhikode
Coimbatore
Tiruppur
Kumbakonam
Tiruchirappalli
Thanjavur
Velankanni
Dindigul
Kodaikanal
Gandhigram
Kochi
Madurai
Jaffna
Alappuzha
KERALA
AH43
AH43
Rameswaram
Tirunelveli
Thoothukudi
Thiruvananthapuram
Anuradhapu
Nagercoil
Kanyakumari
Google

Chennai & Coimbatore for obvious reasons - Smart Cities :)

But why Gandhigram?

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Gandhigram Domains

Water management

Renewable energy generation

Waste management / biogas plant

Air conditioning / Cooling

e_mobility

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- Because they think De-central (Gandhian Principles)
- Past achievements
- Aware (respect for Energy, Water, Cleanliness)
- Domain Knowledge
- Possibility to make a difference is higher and faster
- Central Government funded University
- Already motivated: Can show results faster
- Human resources at the University

- Close to the Mountains and the Sea :)

Memorandum of Understanding

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How do we achieve together?

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- People's involvement in implementation (to make it sustainable)
- Encouraging Entrepreneurship and SMEs
- Gandhigram University Association with Industry
- Knowledge Exchange Smart city Schwaebisch Hall (one of the best in the world) – Smart Village Gandhigram
- Partnership with German Universities and Smart grid & RE communities
- Student Exchange Program and Internships
- iPLON and its network (SMEs in Germany and India)
- Funding opportunities (CO2 Reduction, Energy Village, etc.)
- Taking part in Smart City tenders of Coimbatore & Chennai

SmartGridsBW
Energien intelligent vernetzen.

Solar Cluster Baden-Württemberg

Platform / Framework
BW –TN Network

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I ♥ CHENNAI
VOLTAS
A TATA Product

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SOLAR CLUSTER BW

Network of around 40 Baden-Württemberg companies and research facilities from all parts of the solar value chain

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Solar Cluster
Baden-Württemberg

Fit for „India-BW“ Netzwerk re2tn

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stadtwerke Schwäbisch Hall GmbH

Solar Cluster Baden-Württemberg

bw-i Baden-Württemberg International

Lufft a passion for precision

KACO new energy.

Solarstromanlagen Württemberger GmbH

ESTEC Embedded System Technology

Mounting systems for solar technology K2 systems

EnWi GmbH & Co KG Leistung für Zukunft

next solar make it happen.

VR Bank Schwäbisch Hall-Crailsheim eG

DCS

KUEHNE+NAGEL

KUHN water experts – world wide

Easy Smart Grid

manz passion for efficiency

??????

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SMART GRID CONSORTIUM - BW

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- Smart City
- Associations
- TSO Transfer/ Network Operators
- Multi Utility Companies
- Smart Grid
- Universities
- R&D

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Next Steps

2016

- 17. Nov. : Stuttgart Solar Cluster : Chances/Risks in India
- 24. Nov.: Chennai : Smart City SHA / Chennai /Gandhigram
- 28. Nov.: Stuttgart : Solarbranchentag : Solar Cluster

2017

- 22.-29. Jan. : Winfried Kretschmann in Pune und Bangalore
- Mitte Feb. : OB Pelgrim in Chennai/ Gandhigram
- April : Solar-Cluster -Team in Chennai / Gandhigram
- Juni : Gandhigram-Team in Schwaebisch Hall
- Juni : Intersolar 2017 München

Solar Cluster
Baden-Württemberg

I CHENNAI

Thank you

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GANDHIGRAM RURAL INSTITUTE DEEMED UNIVERSITY

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Möglichkeiten der Finanzierung und Beteiligung an Entwicklungen und dem Einsatz von Multi-Utility-Lösungen innovativer Technologien im Bereich Solar, Microgrid, Wasser und E-Mobilität in Indien

Christoph Blaschke, Geschäftsführer Next Solar Concepts

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Smart Cities Mission

Chennai & Coimbatore as Smart Cities in India

Presented by

Alfred Vinod Antony

Progen Energy Solutions

Coimbatore

What is a smart city?

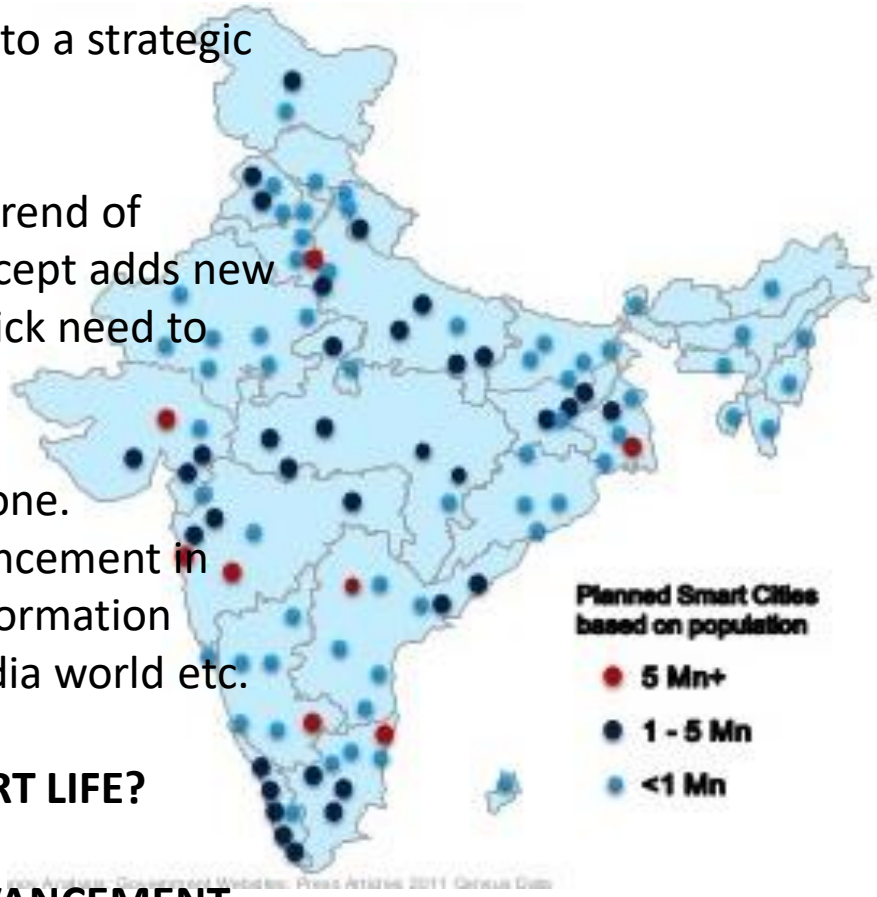
A **Smart City** is the integration of technology into a strategic approach to sustainability.

21st Century has brought with it a new global trend of "sustainable urban development" and this concept adds new dimensions to urbanization which require a quick need to upgrade existing cities.

The concept of a smart city is a relatively new one.
Over the years, we have made significant advancement in various technologies like computer science, information technology, remote sensing, advance multimedia world etc.

But the question is **HOW WE CAN LIVE A SMART LIFE?**

HOW CAN WE USE THIS TECHNOLOGICAL ADVANCEMENT TO LIVE A SMART LIFE?

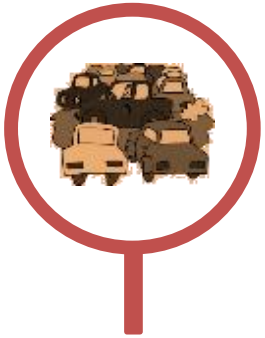


Source: smartcities.gov.in

Need for smart city?

Large scale urbanization is posing several problems which will be accelerated further

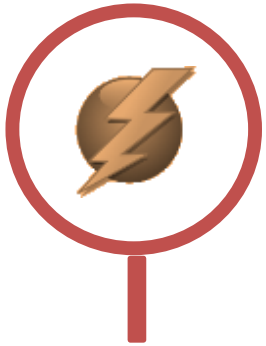
Traffic



Traffic congestion costs $10 Bn/year

- **3** Indian cities in the top 10 list of worst traffic conditions
- **1%** of world's cars in India amounts to **10%** of world's road accident deaths

Power



India loses $ 68Bn of its GDP due to electricity shortage

- India faces daily power outage of **30,000 MW**
- Over **300 Mn** citizens do not have access to electricity

Water

40-50% water lost in the distribution system

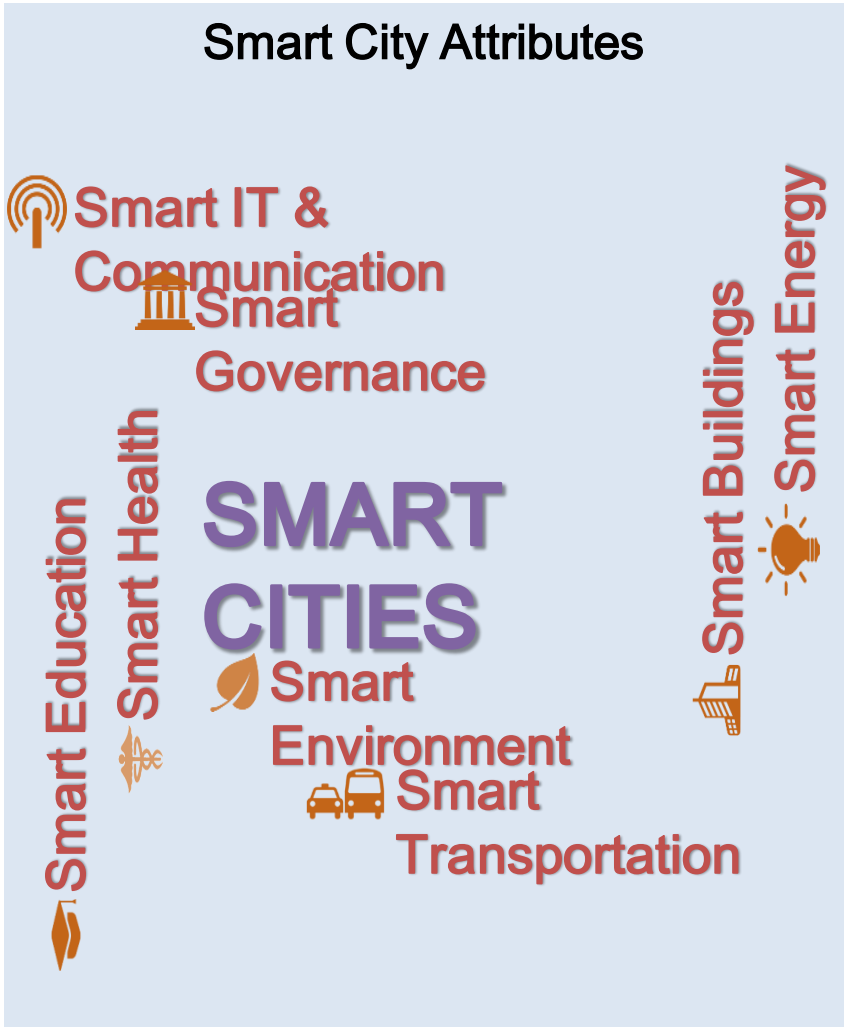
- **22** of India's 32 big cities face water crisis
- **170 Mn** people in urban areas have no access to safe water

Healthcare

1 doctor for every **1,700 people**

- More than **one in four** newborn deaths occur in India
- Only **~5%** of Indians are covered by health insurance policies

Government is trying to address these problems by investing in smart city initiatives



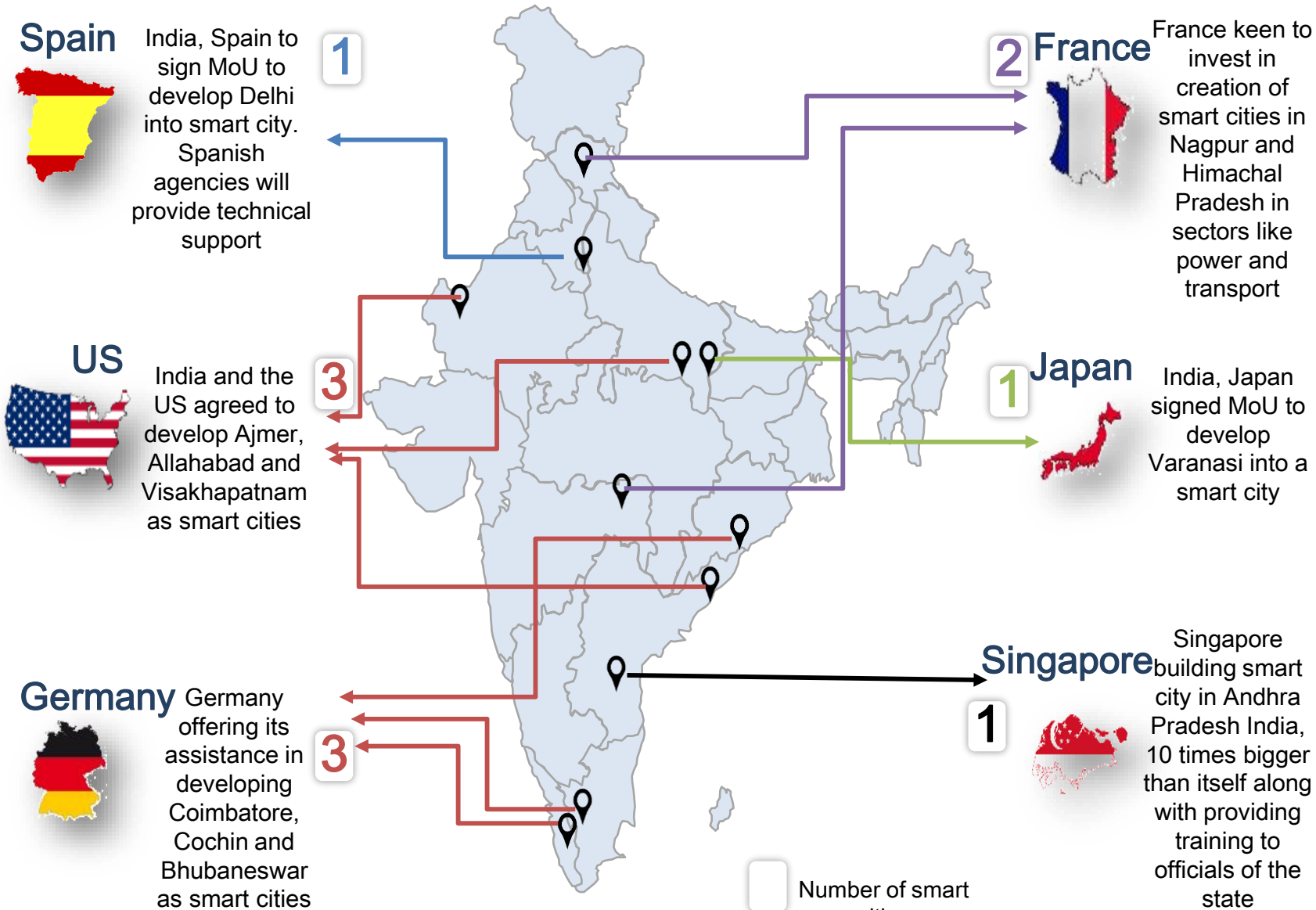
Government Investments

$350 Mn	Budget set aside for smart cities in 2015-16, down from $ 1.2 Bn last year (2014-15)
$165 Mn	Central funding required per smart city over next 10 years, as estimated by the Government
13%	Government spent on smart cities of the total budget allocated in 2014-15
PPP Model	PPP Model to be followed by Government for the development of Smart [illegible]

About 80-85 per cent of the project cost will be borne by the private sector

Ministry of Urban Development under Central Government is the governing body for all smart city related work

Multiple foreign countries are looking forward to invest and participate in the development of smart cities in India



Approach For Chennai & Coimbatore

Baseline assessment ⟷ **Consultations - Round I**

- Earlier studies
- Ongoing / proposed initiatives / plans
- Service levels / assessment indicators

- Face-to-Face, Social Media/My Gov
- Dissemination on Media / Website
- MOUD guidelines

Formulate City Vision, Goals & Strategies

- Review Vision and Goals under earlier initiatives
- Validate Vision themes and Priority Goals from Consultations

Crystallise Vision Statement, Values, Goals and Strategies

Areas for self-assessment suggested by GoI

1	City Identity and culture	13	Water management
2	Economy and Employment	14	Waste-water Management
3	Mixed Use	15	Waste management
4	Compactness	16	Sanitation
5	Walkable	17	Air Quality
6	Transport	18	Housing and Inclusiveness
7	Open Spaces	19	Education
8	Energy Supply	20	Health
9	Energy Source	21	Safety and Security
10	Energy Efficiency	22	Citizen particpiation
11	Underground wiring	23	IT connectivity
12	Water Supply	24	Intelligent Govt. Services

Grouped under 4 themes for baseline assessment and eliciting suggestions / formulating Vision, Priority Goals and Strategies

Framework for Smart City Concept Plan

Baseline Assessment, Consultations

Structure, Economy, Mobility • City Identity and culture • Economy and Employment • Mixed Use • Compactness • Walkability • Transport • Open Spaces	**Watsan, Energy and Environment** • Water Supply / Management • Waste-water Management • Waste management • Sanitation • Energy Supply / Source / Efficiency • Underground wiring • Air Quality
Inclusion, Housing and Security • Housing and Inclusiveness • Education • Health • Safety and Security	**Smart Solutions and IT-led delivery** • Citizen participation • IT connectivity • Intelligent Govt. Services

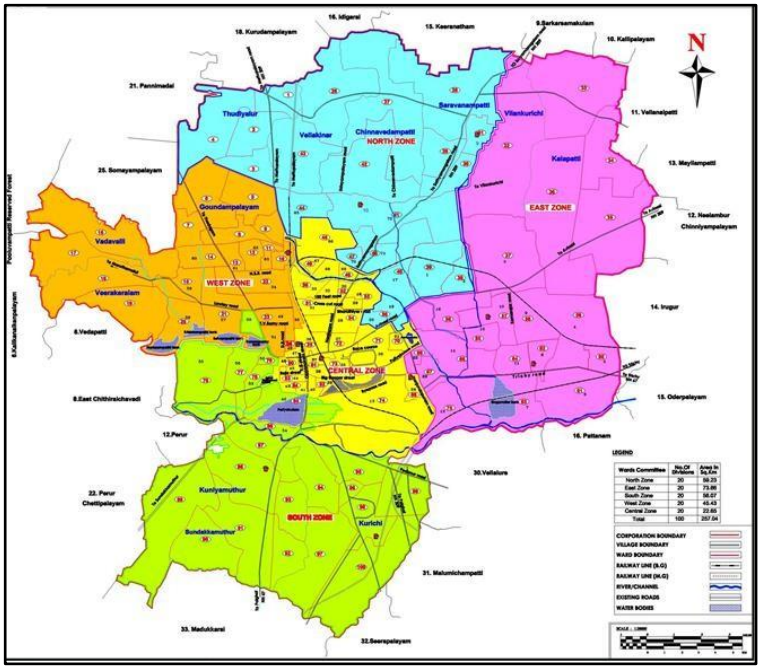
Vision, Priority Goals and Strategy

Vision Statement - Coimbatore

Coimbatore will be an inclusive, secure, effectively governed and well-planned global metropolis that offers universal, affordable access to Best-in-Class Civic services and efficient Transit Orientation while fostering a Dynamic and Vibrant Economy, nurturing a Clean, Green, Resilient and Sustainable Environment and striving to provide the highest Quality of Living standards for a progressive, diverse and talented populace.

Coimbatore City Structure and demographics

- Coimbatore Corporation expanded in 2011
  - Area – **257.04 sq.km**
  - **5 Zones**, **100 Wards**
- Population and density
  - At Census 2011 – **16.02 lakh**
  - Decadal Growth **73.78%***, within Core area ~ **15.45%**
  - Density **63 ppha;** within Core area ~ **104 ppha**
  - 2015 Population ~ **17.28 lakh**; **27.84 lakh by 2045**
- Regional connectivity and growth pattern
  - Dense areas: Core city, Kaundampalayam and Kuruchi
  - Growth along radials in North, South and East
  - 3 NHs- NH-47, NH-67 and NH 209 traverse city
  - International airport and railway junction

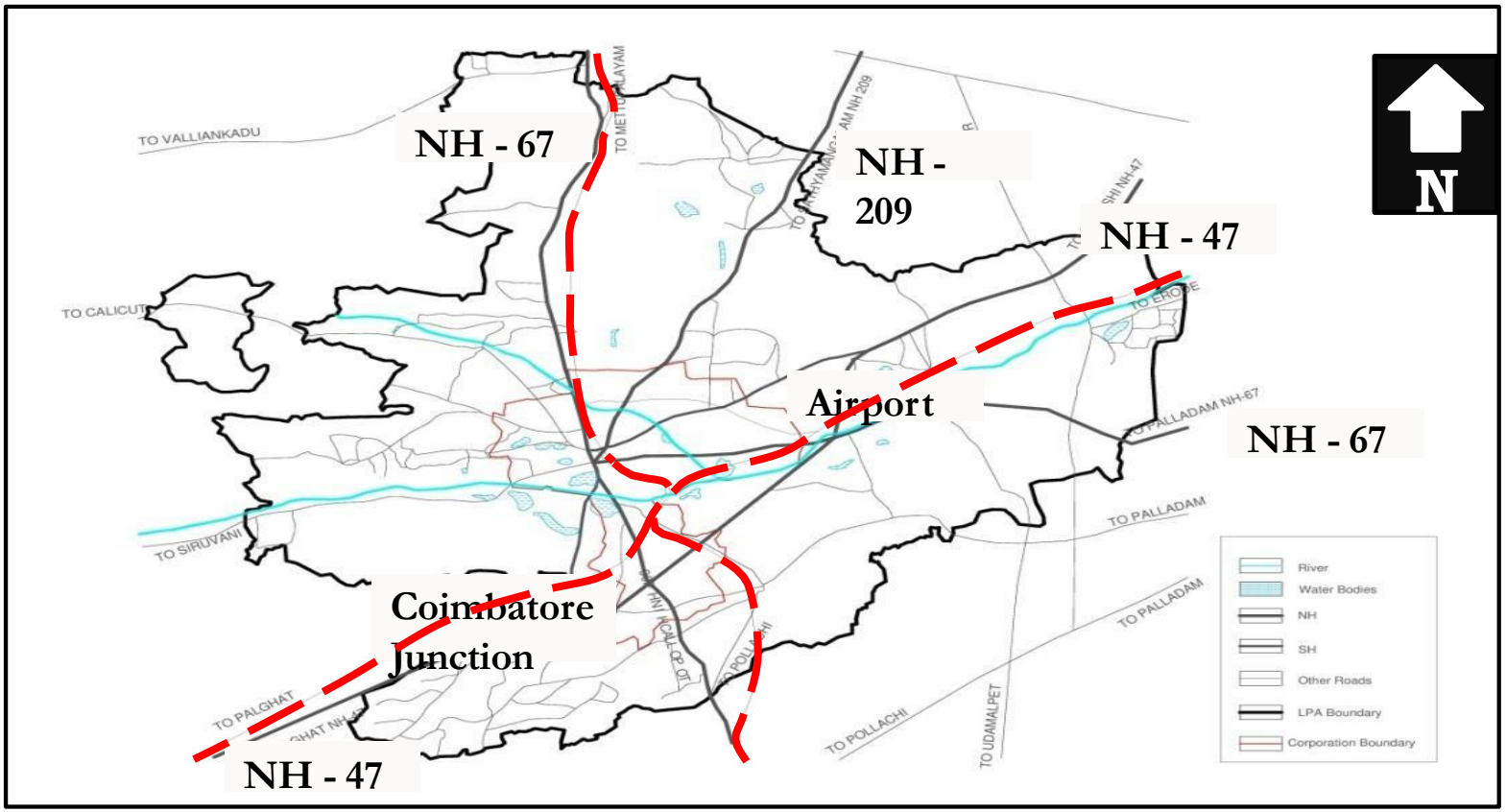


*Corporation area expanded by merging neighboring areas

City Economy

- Economy of Coimbatore District
  - 4th largest economy among TN districts; 6th in per capita terms
  - Large secondary sector contributing over 40% to the Economy
  - Key industries include Textiles, Foundry and manufacturing
  - Largely Services based; Tertiary sector provides major employment to the population
  - Second largest software service provider in Tamil Nadu
  - Serves as a major education and textile hub
  - Houses country's largest amount of hosiery and poultry industries
  - Health industry alone stands at Rs. 1500 crore as on 2010
  - Two SEZs- Hi-tech infrastructure and TIDEL Park (five more proposed)

Mobility.



- Road Network ~ 2224 km of which 112 km are arterial roads
- Road length per sq. km ~ 8.65
- Surfaced roads >70%
- Several Railway Level crossings in the city

Mobility..

- Modal share of trips
  - Bus - 42% Two Wheeler - 21% Walk -14% Car -17% Cycle – 1% Autorickshaw – 5%
  - Average motorised trip length ~ 10 km
- Bus Transport operated by TNSTC / private operators
  - Over 940 city buses (TNSTC- 640 , private- 300)
  - Number of mofussil routes is 119 with 500 buses
- CMP proposals
  - 53 roads under road development plan including Ring road and Bypass road
  - Junction improvements include 7 signalization and 7 flyovers
  - 9 Road over bridges and Road under bridges
  - 9 Foot over bridges/ subways
  - Relocation of Gandhipuram Bus Stand, Mofussil Bus Stand, Town Bus Stand and Thiruvalluvar Bus Stand at Vellalore
  - Parking facility proposals include 2 off- street On- ground and 7 MLCPs
  - BRT/ LRT – 2 corridors , Metro- 2 corridors
  - NMT proposals include construction of 460 km of footpaths and cycle tracks

Open spaces, green areas and parks

- Prominent Green Spaces in city
  - Developed Parks include VOC Park, Kovai Courtallam, TNAU Park, Race Course Children's park
- Issues
  - Limited open spaces vis-à-vis norms
  - Pollution in canals
- Proposals
  - Green cover around Odais , canals and water bodies
  - Cleaning of odais and 8 water bodies
  - Identified 74 locations to develop children parks and green space

Particulars	Quantity
Open spaces/ parks (Nos.)	69
Area of parks (sq.m)	93672

Particulars	Status	Norms
OS availability sq.m/cap.	1.19	10-12
OS in built up area sq.m/cap.	0.59	2

Water Supply

- Existing scenario
  - Siruvani, Pillur, Aliyar and Bhavani
  - Extended areas not yet serviced
  - Less than 50 % of households have access to piped water supply
- Pollution of groundwater and surface sources a serious concern
- City fares well on cost recovery and collection efficiency
- DPR for 24x7 supply for core areas
- Proposals for improving storage capacity and source augmentation sent for AMRUT funding

Physical Infrastructure needs

Particulars	Unit	Current	2021 Demand
Treatment	MLD	275	309
Storage	LL	475	877
Distribution	km	1007	3069

Existing Service Levels Vs. Norms

Indicators	Existing	Norm
Coverage	**44%**	100%
Per capita supply	**39 LPCD**	135 LPCD
Metered connections %	**26%**	100%
NRW %	**56%**	20%
Quality	**75%**	100%
Cost recovery	**60%**	100%
Collection efficiency	**60%**	90%

Domestic waste-water management

- Existing system
  - Covers only an area of 18 Sq.km (7% of total area) having sewer lines of 162 (5% of total road length) km and 24380 (5% of house holds) service connections
- Underground Drainage System under construction
  - Area of 87 sq.km, Sewer Lines 582 km and 103506 connections
- DPR for uncovered areas prepared along with reuse of treated water.
  - Estd. Project cost = Rs. 1631 crore
- Feasibility / Transaction advisory for TTRO/Waste-water reuse initiated
- Access to Toilets needs improvement
  - 7.5% of the households are without any outlet or toilets
  - Discharge of sewage to water bodies and storm water drains.

Municipal Solid Waste

Waste Generation	TPD	815
Generation per capita/day	gms	504
Service benchmarks		
Service level	**Norm**	**Existing**
Door to door coverage	100%	80%
Efficiency of collection of MSW	100%	95%
Segregation	100%	60%
MSW recovery and disposal	100%	65%

- 500 MT collected transported to compost plant in Vellalore operated by a private agency
- 100 MT is transported to Vermi Compost plant and bio-gas plant
- 10 MT of solid waste is sent to bio-methanation plants for waste to energy conversion
- Winner of SKOCH award for decentralised waste management recently
- Key Initiatives/ Proposals
  - New 100 MT plant for C&D waste + New processing plant of capacity 500 MT in Vellalore
  - Proposal for 100% source segregation and decentralization of disposal of solid waste
  - Additional capacity creation for bio-methanation under consideration

Water ways and drains

Storm Drain length (manmade)	Km	1780
Natural Drains (7 Nos.)	km	45
No. of locations of water logging	Nos.	78
Incidence of sewerage mixing	%	25% of total HHs

- Dumping of sullage and waste-water in Storm drains
  - 25% of the households discharge waste water directly into the drains
  - Identified 8 location of chocking of drains because of solid waste
- Inadequate routine maintenance and cleaning and de-silting of drains
- Key Initiatives/ Proposals
  - Proposal for construction of storm water drains in added areas
  - DPR for rejuvenation of water bodies

Energy

Electricity Infrastructure

Particulars	Unit	Quantity
Sustained Demand	MW	500
No. of substation	Nos.	12
Demand met by renewable sources	MW	10

Street lights

Particulars	Quantity
Street Lights - nos.	69292
Spacing between streetlights	42 m

- Need to improve distribution infrastructure
- Key Initiatives/ proposals
  - Underground electric cable system through the city in pipeline
  - Solar energy generation meeting at least 10% of demand (50MW)
  - Energy efficient lighting could help achieve energy savings and savings in maintenance / replacement

Urban Environment

Issues

- **Water**: water bodies contaminated because of discharge of untreated domestic and industrial effluents
- **Air:** Core City area experiences heavy traffic and air pollution. Particulate Matter (PM) values higher than norm
- **Noise:** Noise level in core city area high due to continuous traffic flow
- Lack of green cover resulting in temperature increase in the city

Key Initiatives/Proposals

- Rejuvenation and preservation of 8 contiguous water bodies in City proposed
- Creation of a Green area and open space on Old Jail land proposed

Services to urban poor

Particulars	Unit	Quantity	Indicators
No of Slums	**No.**	**231**	**In the entire area**
Slum Households	Nos.	36151	15 % of households
Slum population in core area	**Nos.**	**180775**	**22 % of population**

- Slums facing constraints in access to basic services
  - Densely populated and inadequate infrastructure
  - Most of the slums located in environment sensitive areas like low lying areas
  - Poor access to public convenience, Solid waste collection, storm drainage and street lights
- Slum redevelopment plans proposed as per the Slum free city action plan
  - A total cost of Rs. 2923 crore proposed for both preventive and curative measures

Healthcare and education

Healthcare

- Preferred healthcare destination for people from nearby districts
- More number of doctors and nurses required

	Health facilities	Total
1	Hospitals	143
2	Dispensaries	140
3	PHCs	110
4	Health Sub Centres	328
5	Other Medical Institutions	221
6	Bed Strength	1717
7	No. of Doctors	537
8	No. of Nurses	491

Education

- On Quantitative parameters – Coimbatore fares well
- Need for modernization of schools

	Education Centers	Total
1	Professional colleges	192
2	Training Institutes	24
3	Higher Secondary Schools	321
4	High Schools	483
5	Primary schools	131

Markets and Bus Terminus

Observations

- About 21 markets which are many years old; they are in dilapidated condition
- Six bus terminals -Town Bus Stand, Ukkadam Bus Stand, Singanallur Bus Stand, Mettupalayma bus stand, Thiruvallur Bus stand and the Central Bus Stand at Gandhipuram

Key Initiatives/ Proposal

- Improvements to vegetable and fish markets proposed
- Redevelopment of two markets at Metupalayam road and Sundarapuram proposed
- Relocation / Re-development of Bus terminals and integrated new bus terminal at Vellalore proposed

City Structure, Economy, Mobility and Open spaces

Watsan, Energy & Environment

Housing, Inclusion & Security

Citizen Engagement, Governance & IT-led service delivery

E-governance and Citizen-led service delivery

- Electronic delivery of services
  - Online payment gateway for all revenues; property tax, profession tax, user charges and non-taxes
  - Online Grievance redressal
  - Online provision of birth and death certificates
  - Online building plan submission
  - E-tendering
  - Upgrade to web-enabled application proposed

- Surveillance: CCTV surveillance at important locations

Priority Goals and Strategies..1

THEME 1 - Universal access to Best-in-Class Core Services

GOALS	STRATEGY(IES)
100% access - 24x7 Metered Piped Water Supply	• PPP for 24x7 water supply in Core Areas • Augmentation of Source / Treatment • Extension of 24x7 water supply
100% access to safe collection and disposal of Waste water	• Completion of ongoing UGD system • Implementation of UGD for uncovered areas • Septage mgmt/decentralised treatment for uncovered areas • Evaluate feasibility / Implement Re-use projects
100% compliance to SWM Rules 2000	• Extension Project Shunya - Decentralised SWM • Expansion of Waste processing capacity • Bio-methanation plans for local waste treatment • Facility for Processing of C&D Waste
Open Defecation free city	• Expand provision of Public Toilets / Namma Toilets
Housing for all / Inclusion	• Implement Slum-free City Action Plan proposals • Designated Hawking Zones • Enforcement to prevent encroachments • Expand/modernise Public Healthcare / Primary schools
24x7 Electricity and Broadband Access	• Ducting, distribution improvements, underground cabling • Facilitate WiFi Hotspots and Fiber backbone

Priority Goals and Strategies

THEME 2 – Effective Transit orientation

GOALS	STRATEGY(IES)
Reduce Accidents and Fatalities to Zero	• Act on actions identified on Accident Black Spots • Implement synchronised signalling and ITS systems • Strengthen enforcement; implement CCTV surveillance
Increase share of Public Transport	• Improve Bus systems to increase share of Public Transport • Implement Mass Transit solutions on identified corridors • Re-design Bus shelters and spaces of high floating population to enable seamless integration
Improve NMT Facilities	• Implement NMT measures identified in CMP
Reduce Traffic Congestion	• Implement Ring Road development and new Roads • Bridges, Grade Separators, Junction Improvement • Implement proposals for relocation/redevelopment of Markets, Bus terminals and Institutional areas
Address other Regional and Trunk Infrastructure needs	• Work with AAI to facilitate Airport Expansion / more flights • Regional High Speed Trunk Road/Rail connectivity

Priority Goals and Strategies

THEME 3 – Clean, Green, Resilient, Sustainable Environment

GOALS	STRATEGY(IES)
Increase Green Cover	• Rejuvenate and improve eight lakes and green areas around it • Rejuvenate Singanallur Tank • Implement proposed program to develop Parks • Road improvements and Avenue Trees
Arrest Water Pollution and improve Ground water table	• Continued focus on RWH and thrust on Re-use • Stringent enforcement of Industrial Pollution prevention measures • Complete UGD projects and implement septage management policy of GoTN
Increase share of Clean Energy	• Continued thrust on Solar and Wind generation
Improve Air Quality	• Ambient Air Quality monitoring • Initiate traffic improvement measures • Awareness programs to reduce idling in traffic
Implement Recommendations and Actions identified under Solar City Plan	
Identify and implement Actions to deal with Climate Change and build resilience	

Priority Goals and Strategies

THEME 4 – Progressive, diverse and talented populace

GOALS	STRATEGY(IES)
Improve Soft Infrastructure	• Facilitate creation of soft infrastructure facilities – Multi-Sports stadium, Museum, and Theme Park
Facilitate creation of world class Health care and Education facilites	• Work with GoTN to implement Medicity as envisaged under Vision TN 2023 • Evaluate feasibility to create a Greenfield Knowledge City
Create Infrastructure and enabling environment to attract Investments in core and sunrise sectors	• Work with GOTN to implement proposed nodes on the Cbe-Salem Industrial corridor • Prepare Detailed Development Plans for peripheral areas to facilitate investments in sunrise sectors including IT and Financial services

Priority Goals and Strategies

THEME 5 – Effectively governed, well-planned metropolis

GOALS	STRATEGY(IES)
Transparent Seamless Governance and Effective Citizen Engagement	• Implement proposed Web-Enabled E-governance application • Improve Information Disclosure standards and enforce compliance • Strengthen Grievance Redressal and expand to create an active Citizen Engagement Platform
Inculcate a Planning Culture	• Prepare updated Master Plan for expanded CMC; prepare Detailed Micro Area level Plans in a time bound manner • Create capacity at ULB for preparing and enforcing Master Plans and DDPs
Enhance Capacity to Deliver	• Undertake a Zero-base assessment of manpower and technology needs
Rationalise Taxes and Fees	• Work with GOTN to rationalise taxes and fees while removing distortions and improving coverage

Pan-city initiatives – ideas under consideration

- Basic services with smart features
  - 24x7 Supply for Extended Areas (converged with ongoing PPP project)
  - Sewerage for extended areas
  - City wide Renewal of Water Bodies
  - Proposals identified under NMT under CMP
  - Municipal Solid Waste collection and segregation
- Other 'smart' initiatives
  - Web-enabled E-governance / Mobile apps based e-governance
  - City wide fibre networks and WiFI Hotspots
  - Underground electric cabling, ducting for utilities
  - Energy efficient street lighting
  - CCTV surveillance
  - Waste Processing / Waste- to Energy

Initial listing; to be finalised

Scalability: Can it be scaled up quickly – say within 5 years

Bang for the buck: Multiplier Impact Vs. Level of Financing required

Implementabilty: How easy it is to implement

Thank You

Best Practices followed in Smart City Schwaebisch Hall for Climate Protection/ CO 2 reduction

The European Energy Award® is a programme for planning and implementing energy and climate protection policy goals and measures in municipalities.

Abhijit Singh Sachdeva, International sales

iPLON Germany / Director iPLON India

“Topics covered”

- Information about Town Schwaebisch hall
- Actual energy consumption and CO2 emission /Planned CO2 emissions in 2050
- Renewable energy generation : Climate Protection Projects
- Methodology followed
- Results achieved

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The „Stadtwerke“ Schwaebisch Hall

- Extensive district heating grid for more than 35 years
- Energy production with highly efficient cogeneration technology
- Energy production with renewable energies
- Support of other local authorities for energy supply

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100% Renewable energy target

- Town of Schwaebisch Hall set itself the target to ensure energy security through 100% renewable energy by 2030.
- The aim until 2035 is to cover the heat demand with 100% renewable energies

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Information about Town Schwaebisch Hall

- S**mallest metropolis of the world**: is located in the North-East of Baden-Württemberg
- **39000** residents (Growing Population, Beautiful city in the Hills, Welcoming to Immigrants)
- Two great museums; Kunsthalle Würth Arts Gallery; the International cultural meeting place; Goethe Institute
- A family-friendly town with a medieval atmosphere : A mix of Tradition and Innovation

- **Stadtwerke Schwaebisch Hall has won numerous awards for their work in Renewable Energy & Grid Management (Role Model for lot of other Stadtwerke in Germany and other Utility companies in Europe)**
- Millions invested to establish an independent regenerative energy supply that would cover the demand for power and heating in the town.

C**limate change** is one of the key challenges worldwide. The European Union, the German Government and also the state of Baden-Wuerttemberg have set ambitious aims. But all these aims only can be reached by concrete projects in this area. So for Schwaebisch Hall, Climate Change is a motivation to adapt to Clean Energy technologies

Schwaebisch Hall has been facing up to this challenge. First steps have already been taken by establishing a climate protection concept in 2013 and a new Climate protection office. Its responsibilities include the realisation of selected measures of the climate concept within 3 years. The aim is the CO2 reduction in the city and to limit climate change

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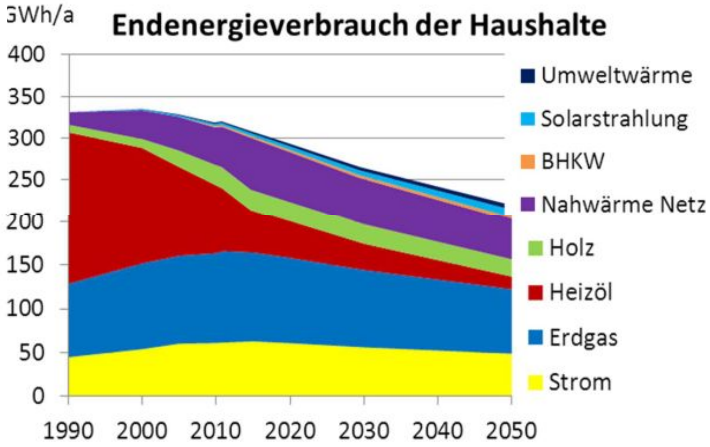
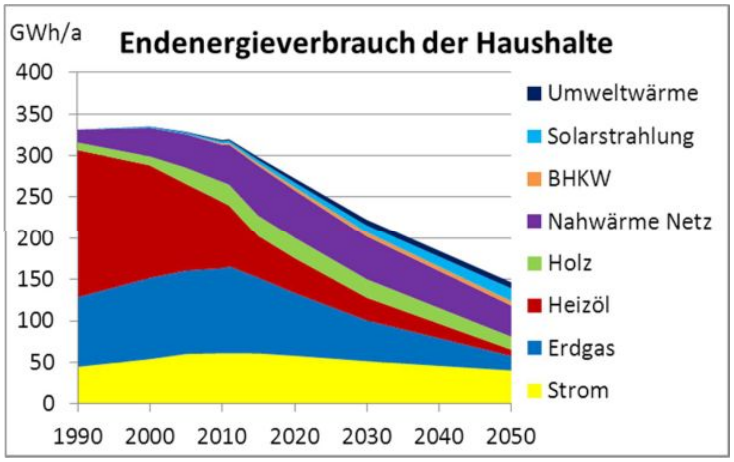
Actual energy consumption and CO2 emission





Private households

Total energy consumption of **the private households** in the reference scenario (left) and in the climate protection scenario (right)

The total energy consumption of the private households is determined by the living space and the insulation standard as well as per capita electricity by the household size and income. During the last 20 years the power consumption of the private households has **increased by 35%.** The heat consumption has declined in the same period by 4% in spite of rising living areas. Gas and district heating replace heating oil as energy source. Solar and geothermal energy play a limited role. Already in the reference scenario there is a decrease of heating demand by 36% and a **decrease of power consumption of 21 % expected.**

But additional measures are needed to reach the aims of the government, essentially a growth of the renovation rate up to 2,5 %/p.a. and higher, share of wood, solar energy and district heating. Each building must reach the level of low-energy house after a building refurbishment.

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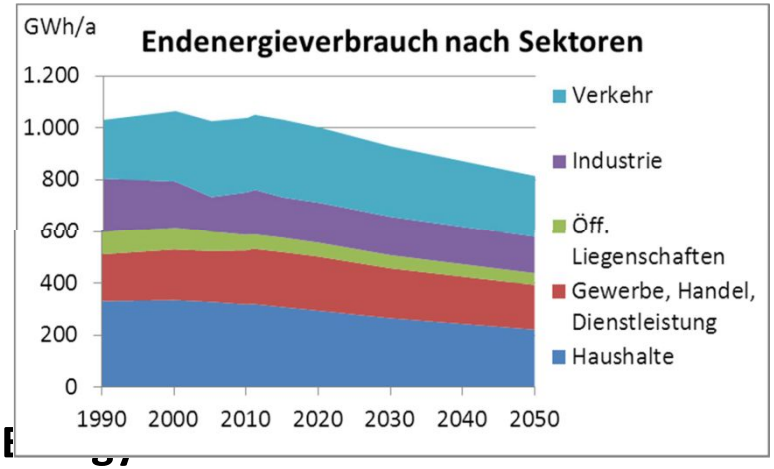

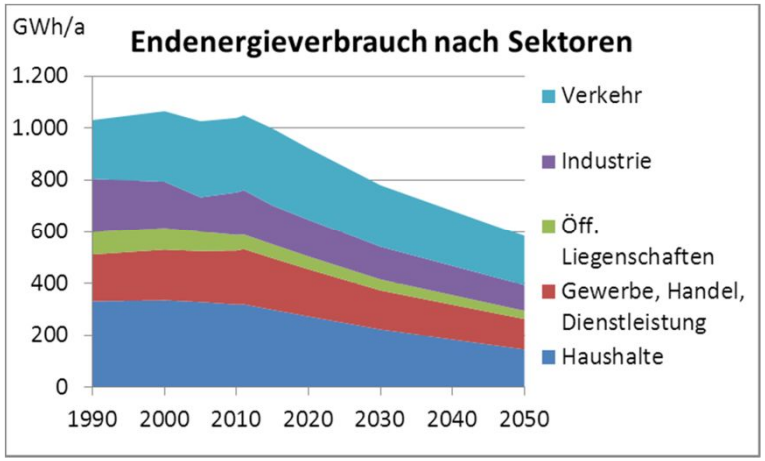

Total energy consumption by sectors in the reference scenario (left) and in the climate protection scenario (right)

On one hand the CO2 balance serves to value the actual state, on the other hand to identify action points. The kind of accounting, the territorial balance is defined in the guideline of the German Institute for Urban Studies (difu). The basis are data of the Statistical State Office, and data of the public utility companies. A problem is the data quality of the consumption of heating oil, wood and fuel.

The reference scenario functions as a reference and updates obvious trends from the past and considers measures which results from national legislation (exit from nuclear energy, energy saving regulations and so on.)

The national climate protection goals **(40% CO2 reduction by 2020 and 80% by 2050)** are considered as guard rails by the development of the climate protection scenario. This is a very ambitious goal. **Natural resources as solar radiation and wind as well as the central functions of Schwaebisch Hall and the economic structure are included to reach the climate protection goals.**

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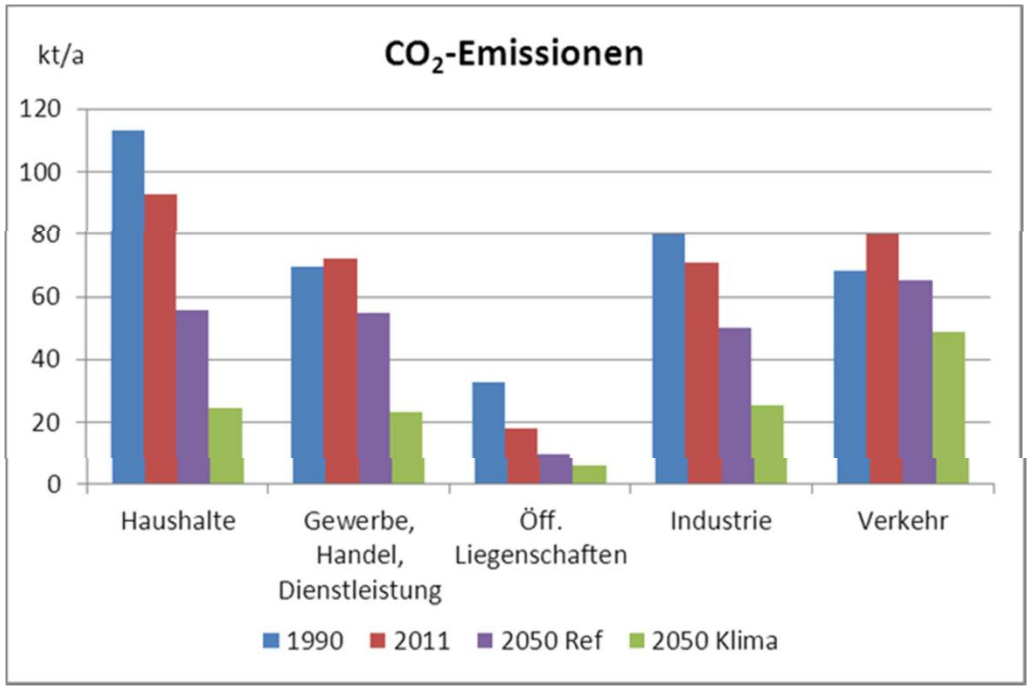
The energy consumption of the town is also defined by the population size and living space, the energy consumption of trade and industry, the driving performance of passenger cars and trucks and the municipal infrastructure. The future development of these parameters has a major impact on the future CO2 balance.

The municipal mission statement believes that the population grows up to 40000 inhabitants while the data of the State Statistical Office point to a decline to 36000 people.

After all the focus of the climate protect concept as well as the proposed measures are independent from the demographic development.



CO2 emissions by sectors households, trade, services and industry, public properties, industry, traffic

While the gas consumption has remained fairly constant since 1990, the share of district heating of the total energy consumption rises from 7% to 11%. On the other hand the share of heating oil had decreased significantly. Renewable energies play to date a subordinate role.

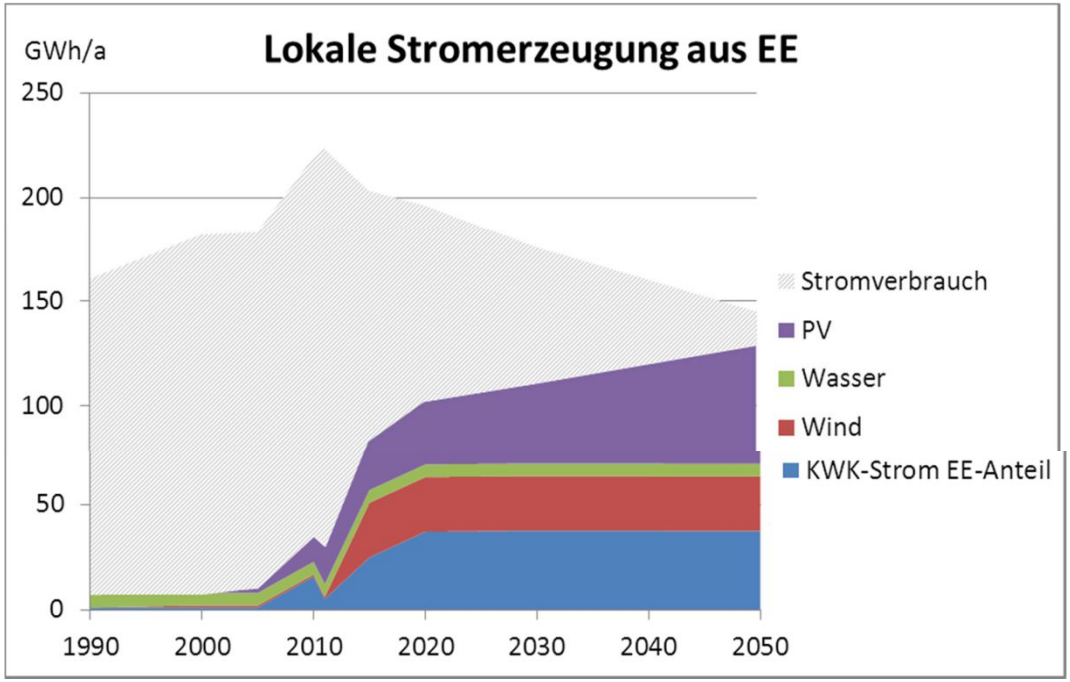
In the climate protect scenario the share of natural gas and heating oil decrease in favor of district heating and renewable energies. It is supposed that the heat consumption will fall more steeply than than the power and fuel consumption. The largest saving potentials are expected in the private households.

In Schwäbisch Hall the share of district heating of the total heat consumption is 20 % and so already twice of the German average. District Heating in Schwaebisch Hall is produced with heat and power cogeneration and through this **Stadtwerke makes a significant contribution to climate protection.** The share of district heating will continue to grow.

In Schwaebisch Hall renewable electricity is especially produced from solar radiation (PV). In the climate protect scenario a considerable portion of wind is added.

In the future especially in the domain of district heating the renewable share can grow.

What is clear, however, is that under the actual framework it is not foreseeable, that Schwaebisch Hall without its surrounding communities is able to reach the goal of covering of electricity demand with renewable energies.



Electricity from renewables in Schwäbisch Hall (goal) - fom above: power consumption, PV, water, wind, share cogeneration

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PV generation

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Bio-mass generation

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Wind energy generation

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Captive Power

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Micro Hydro generation

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Energy Storage

Scalable battery system

- *Voltages can be determined from the number of series-connected modules*

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E-mobility and Smart Parking

Car Sharing Schwäbisch Hall

Car Sharing is spread all over in German big cities … and in Hall!

CarSharing is good for:

- For occasional users, who drive less than 12000 km per year
- As a low-cost alternative to a second car
- For companies which want to save a company car
- If you want to use cars of various sizes, for example a small car for your shopping, a van to make a trip with your family and a transporter to do the relocation from your daughter.
- If you want to transport one or two people with a wheelchair.
- If you wish to use a CarSharing-car in other cities.

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E-learning

The Goethe-Institut is established in Schwäbisch Hall since 1965. It is located in the center of the old city in a historical building. 1995 it was renovated and got new equipment.
To learn the German language leffectively and successfully on a high level, getting to know the people, the country and its culture – that`s what connect all Goethe-Instituts .
They promote knowledge of the German language abroad and foster international cultural cooperation. They convey a comprehensive image of Germany by providing information about cultural, social and political life in our nation. Their cultural and educational programmes encourage intercultural dialogue and enable cultural involvement. They strengthen the development of structures in civil society and foster worldwide mobility.

Areas covered to measure CO2 used by Town Schwaebisch hall

Energy Manager
Heiner Schwarz-Leuser

Climate change Controller
Stefano Rossi

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Climate Protection Policy in the municipalities

Measure catalog

1 Heat networks and combined heat and power

2 Renewable Energy

3 Industry, Business, Commerce and Services

4 Mobility, Traffic

5 Energy efficiency in buildings and restructuring/retrofitting

6 Power consumption, Alimentation and Retail

7 Public Relation, Information and Consulting Service

8 Urbanism, Urban Development

9 Municipal Buildings and Construction

10 Internal organization

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Climate Protection Policy in the municipalities

4 Mobility, Traffic

4.1 strengthening local mobility: implementing the concept “city of the short ways”
4.2 creation of a storyline concept for mobility marketing
4.3 alliance of all means of transport, intermediate modality
4.4 mobility compass
4.5 mobility helpdesk in schools and playschools
4.6 mobility helpdesk in companies
4.7 implementation of bike traffic concept
4.8 gas saving workshops for companies and municipality
4.9 climate protection shelters at gas stations and garages
4.10 increase of energy efficiency of municipal vehicle fleet
4.11 strengthening of car-sharing offers
4.12 strengthening of car pools
4.13 promoting of domestic gas mobility
4.14 promoting of e-mobility
4.15 integration in the net of long-distance bus

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Climate Protection Policy in the municipalities

Scope 4: Mobility, Traffic

4.1 strengthening local mobility: implementing the concept "city of the short ways"
enhancement of local provisioning, especially an attractive and functioning traffic infrastructure including pedestrian paths, bicycle lanes and bus connections.

4.2 creation of a storyline concept for mobility marketing
Focus on Public Relation for directing attention to alternative mobility offers and habits

4.3 alliance of all means of transport, intermediate modality
strategic objective of a city to optimize connection of all means of transport (e.g. tariff offers as an investing measure)

4.4 mobility compass
Information in form of a brochure to all households showing the big offer of traffic systems

4.5 mobility helpdesk in schools and playschools
for identifying and selecting safe ways to school start in a concentrated campaign and inspection of routes and drive ways. Recognition of weak points and peril points.

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Climate Protection Policy in the municipalities

Scope 4: Mobility, Traffic

4.6 mobility helpdesk in companies

rush hour traffic takes an enormous part and the advantages of an environmental friendly mobility should be communicated to the staff

4.7 Implementation of bike traffic concept

creation of a suitable infrastructure with transferring identified weak points

4.8 gas saving workshops for companies and municipality

behaviors training for anticipatory, defensive and low-speed driver operation characteristics with possible savings of about 10 %.

4.9 climate protection shelters at gas stations and garages

CO2-possible savings considering gas-saving tires and fuel-efficient engine oil at about 3 to 5 %. Increased awareness of drivers for tire purchase and oil change through cooperation of the city with gas stations and garages.

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Climate Protection Policy in the municipalities

Scope 4: Mobility, Traffic

4.10 increase of energy efficiency of municipal vehicle fleet

modification of the vehicle fleet from gasoline-driven to domestic gas, acquisition of fuel saving vehicles

4.11 strengthening of car-sharing offers

considerable expansion of existing range with equal promotion

4.12 strengthening of car pools

support through the city with incentives and information to reduce traffic and hence emission

4.13 Incentives for gas driven mobility

domestic gas as fuels is reducing the CO2-emission compared to conventional fuels more than 20%.

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Climate Protection Policy in the municipalities

Scope 4: Mobility, Traffic

4.14 Incentives for e-mobility

The e-Mobility is the future as the CO2 emissions will be drastically reduced. Noise pollution and missing of local pollution emission are additional advantages. E-Mobiliy will drive this form of transportation

The town will bring the different stakeholders (transportation, administration, cars , bikes, scooters distributers, the energy suppliers, the charging stations) together and offer financial incentives so that this form of mobility can be achieved. The town could also offer incentives for its admin staff , healthcare staff and push these target groups which will drive more often downtown to adapt this mobility

4.15 integration in the net of long-distance bus

The railway connectivity is inappropriate and will not change in the future. So the town authorities are determined to get long distance connectivity with BUS transportation from surrounding villages and towns. The public Transportation network (also through E-Buses) will be a priority

Results achieved

- Results achieved in 2015
- Development of a communications campaign
- Measures to encourage cycling and e-cyling, development of cycle ways and charging stations
- Free use of buses in the Advent time to reduce the use of private cars
- Purchase of more electric cars for the fleet of urban vehicles
- Expansion of gas mobility – there a 2 natural gas filling stations in Schwaebisch Hall
- Support of electromobility, installation of charging stations
- Information about laws and funding opportunities for energy consulting and energy-efficient building and renovating on the homepage of the city
- Fair trade city Schwaebisch Hall – award for cities which stand for fair trade in city, politics and civil society
- Recycling - collecting campaign for handies. They are recycled professionally in cooperation with German Telekon and German environment aid.

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Solar Cluster
Baden-Württemberg

I CHENNAI

Ende

SchwäbischHall

stadtwerke
Schwäbisch Hall GmbH

GANDHIGRAM RURAL INSTITUTE DEEMED UNIVERSITY

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Klimaschutz- und Energieagentur Baden-Württemberg GmbH

KEA

SchwäbischHall

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SchwäbischHall

Optimising and successfully implementing Municipal Energy and Climate Protection Activities

The European Energy Award® is a programme for planning and implementing energy and climate protection policy goals and measures in municipalities.

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Mobilität und Verkehr

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The eea is by no means an isolated solution. At the European level, it is interlocked with other programmes and activities, such as the Smart Cities initiative and the Covenant of Mayors. It corresponds, in the best possible way, to the *20-20-20* objectives of the European Union for 2020:

a 20% reduction in emissions compared to 2005

a 20% increase in use of renewable energies

a 20% improvement in energy efficiency

The Covenant of Mayors is an initiative of the European Commission. Among other things, the signatories undertake to:

reduce CO2 emissions in their communities by at least 20% by 2020 in accordance with the EU climate change targets

draw up an action plan for sustainable energy (SEAP). The Covenant of Mayors regards the European Energy Award® as “an efficient tool for Sustainable Energy Action Plans (SEAPs)”.

At the national level, the eea is also in line with national climate protection initiatives (e.g. the 2000 Watt Initiative in Switzerland, and the Climate Protection initiative in Germany). At the regional or local level, it is also compatible with the creation and implementation of climate protection policies.

CERTIFICATION

External certification with a subsequent award represents an integral part of the European Energy Award®.
Part of this certification process involves an external eea auditor carrying out a review of the success of the energy and climate protection activities implemented by each municipality.
If the eea auditor confirms that the municipality in question has achieved the agreed standards and gained at least 50% of the points, the municipality is presented with the European Energy Award®.
If 75% of the points have been achieved and an international certification process has been carried out, the municipality receives the European Energy Award® Gold.
The award documents and publicly acknowledges successful measures. It also strengthens the municipalities' function as role models with regard to energy efficiency and climate protection. Furthermore, the targeted promotion of the locations in question is also carried out

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Our objective is to actively shape climate protection policy in the State of Baden-Württemberg by supporting municipalities, church institutions and small and mediumsized enterprises (SME), especially in the areas of

- energy conservation,
- the rational use of energy and
- the use of renewable energies.

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Energy schemes

KEA develops energy schemes for new greenfield developments, conversion areas and existing building complexes with the aim of establishing a sustainable energy supply. We work together with our clients to assess heat demand, energy efficiency requirements and other determining factors. We take various energy-efficiency building codes and standards (from minimum requirements according to national building code EnEV up to passivehouse) and various possible sources of energy into consideration. We investigate the use of renewable energy and cogeneration systems, sometimes in conjunction with a small district heating system. To design these networks, we use geographical information systems (GIS). Our clients can make sound decisions based on heat production costs and the CO2, energy and emissions balance. Sensitivity analyses indicate how various combinations will perform with respect to projected future energy costs. Ideally, supplying energy to residential and industrial areas through small district heating systems links the use of renewable energy with cogeneration systems.

R www.kea-bw.de/e-konzepte

THE STEP-BY-STEP PROCESS

Analysing

With the help of comprehensive eea management tools, the energy and climate protection projects that have been carried out in the municipalities to date are investigated and the current situation is recorded and assessed. The result of the analysis is a profile of the given municipality's strengths and weaknesses.

Planning

Based on the analysis of the current situation, the untapped potential of municipalities' sustainable climate protection can be identified and priorities defined. The "Energy Policy Plan" is drawn up and defined with a binding action plan for the year to come.

Implementing

The measures specified in the Energy Policy Plan are implemented.

Auditing

After the implementation phase, the measures carried out are recorded and assessed. The energy team and the consultant carry out an (internal) audit once a year to verify whether the planned measures have actually been implemented and the goals set have been achieved.

Adjusting

The analysis of the current state is adjusted or updated in line with the outcome of the audit. The cycle then starts again.

Certification

Within the framework of the eea, a distinction is made between the review of what has been achieved as conducted by the energy team in collaboration with the consultant and the review conducted by an external expert. The external eea auditor is usually called in to review the achievements whenever the municipality has attained 50% or more of the maximum possible points in the initial assessment. This eea auditor is also responsible for the certification.

Award

If, after the assessment, a municipality is able to demonstrate particularly successful achievements and the result is confirmed by the auditor, then the municipality is presented with the European Energy Award® or the European Energy Award® Gold.

Quality management of the European Energy Award®

The basic principle of the European Energy Award® is the process based on the management cycle of “analysing – planning – implementing – auditing – adjusting” that is typical in the business world, supplemented by the “award”.

high level commitment

formation of an energy team

initial energy review

processing of energy policy programme

project implementation

certification and awarding

Climate protection Concepts

For municipalities, we develop comprehensive climate protection concepts. We focus on the energy balance – the carbon footprint of the city – and development of an action plan and a communication concept. It's very important to involve every relevant stakeholder in the city. The Bundesumweltministerium (Federal Ministry of the Environment, Nature Conservation
and Nuclear Safety) has been funding

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Municipal Energy Management (MEM)

As numerous studies and practical experience have shown, there is often great energy conservation potential in public properties. On average, the annual cost of electricity and heat in public buildings in Baden-Württemberg amounts to approximately 30 euros per citizen. Experience has shown that these costs can be reduced by about 30 %. Half of these savings can be achieved through non-investment energy-management measures, for example energy use analyses, optimizing heating systems, training caretakers and educating consumers.

KEA's MEM model is designed to implement energy management in public buildings in such a way that it will bring our clients the greatest benefit and the least risk: the energy savings achieved are verifiable and will pay for the program. KEA also offers energy-management consulting to businesses and service providers. KEA has already helped more than 60 municipalities meet their energy-management

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Benchmarking Germany / Tamil Nadu

Country	Area	Per person Consumption	Number of Utility Companies	Population
Germany	357,021km^2	7081 kWh/year	> 800	80,767,000
Tamilnadu, India	130,058 km^2	684 kWh/year	1	72,138,958

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http://smartcities.gov.in/

ILLUSTRATIVE LIST

Smart Solutions

E-Governance and Citizen Services

1. Public Information, Grievance Redressal
2. Electronic Service Delivery
3. Citizen Engagement
4. Citizens - City's Eyes and Ears
5. Video Crime Monitoring

Waste Management

6. Waste to Energy & fuel
7. Waste to Compost
8. Waste Water to be Treated
9. Recycling and Reduction of C&D Waste

Water Management

10. Smart Meters & Management
11. Leakage Identification, Preventive Maint.
12. Water Quality Monitoring

Energy Management

13. Smart Meters & Management
14. Renewable Sources of Energy
15. Energy Efficient & Green Buildings

Urban Mobility

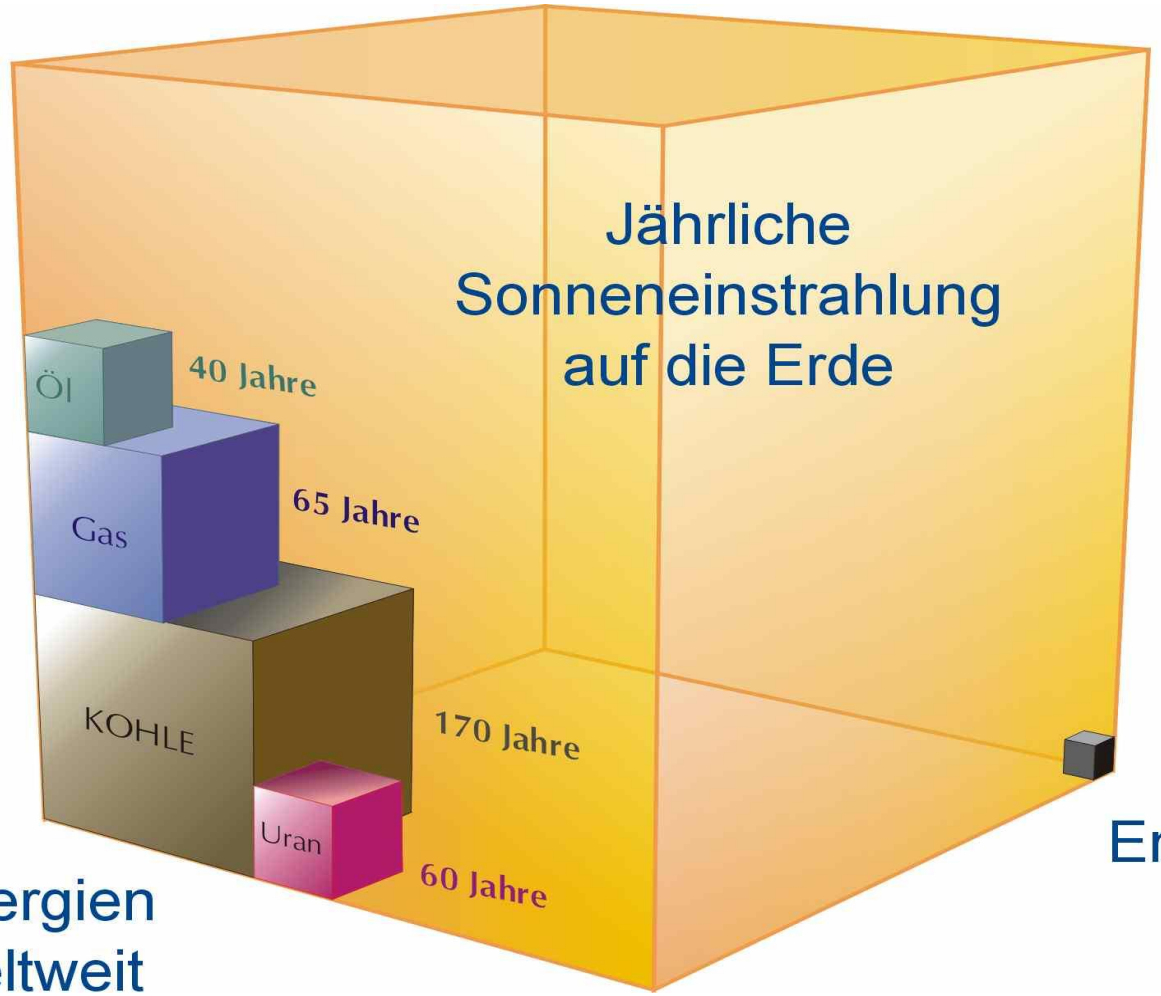
16. Smart Parking
17. Intelligent Traffic Management
18. Integrated Multi-Modal Transport

Others

19. Tele-Medicine & Tele Education
20. Incubation/Trade Facilitation Centers
21. Skill Development Centers

iPLON®
The Infranet Company

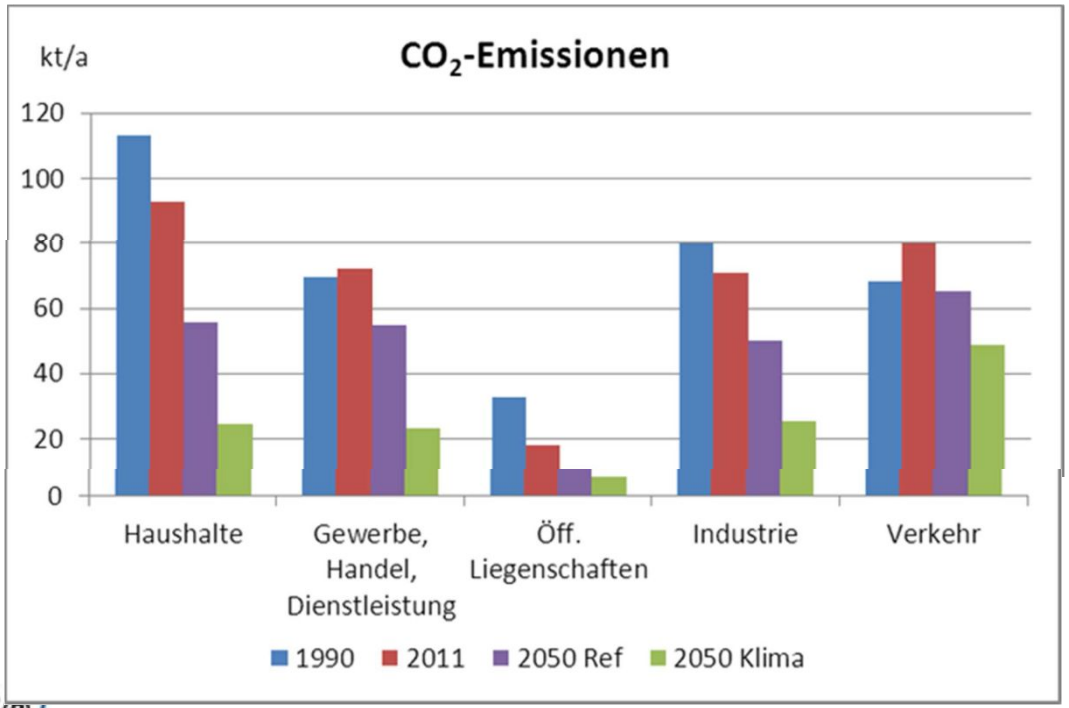
Energieversorgung und Energiebedarf



Fossile Energien
Vorräte weltweit

Weltweiter
Energieverbrauch

iPLON®
The Infranet Company



iPLON®
The Infranet Company

Grid stability issues in Schwäbisch Hall

Stadtwerke Schwäbisch Hall GmbH

Peter Breuning

Smart City-- Chennai

Peter Breuning

Head of department: grid control & engineering services at Stadtwerke Schwäbisch Hall GmbH (multiy utility)

Lecturer University Heilbronn

Speaker IDS User Group --52 Multi Utility Companys

Member working group FNN (VDI) (directive for power plant connections, HV-grids)

Technical Direktor "power grids" - Smart Grid plattform BaWü

Agenda

- Top 1 presentation grid control room Stadtwerke Schwäbisch Hall und related business unit
- TOP 2 we need a new system (hole around the world)
- TOP 3 grids in Europe and Germany
- TOP 4 solutions
- TOP 5 training

TOP 1 Power Company Schwäbisch Hall in a smart city

electricity
350 GWh/a

natural gas

water
2.7 Million m3/a

thermal energy
130 GWh/a

indoor/outdoor
swimming 700.000
people in 2015

parking for
2000 cars

Stadtwerke
Schwäbisch Hall GmbH

ca. 500 Mitarbeiter, davon
16 Auszubildende
262 Mio. € Umsatz

260 Mio. € turnover
more than 6 Mio.€ profit/a

Energiedienstleistungen:
Contracting
Sherpa: ca. 600.000 Kunden
Zählerfernauslesung und EDM
Prozessführung von
technischen Anlagen

Facility-Management
224 Stationen
18.900 Datenpunkte

Kraftwerke:
48 BHKW-Module
1 GuD-Kraftwerk
6 Biomasse-KWK-Anlagen
3 Holzheizwerke
6 Wasserkraftwerke
2 Windkraftanlagen

126 Mio. kWh/a Strom
aus Eigenerzeugung

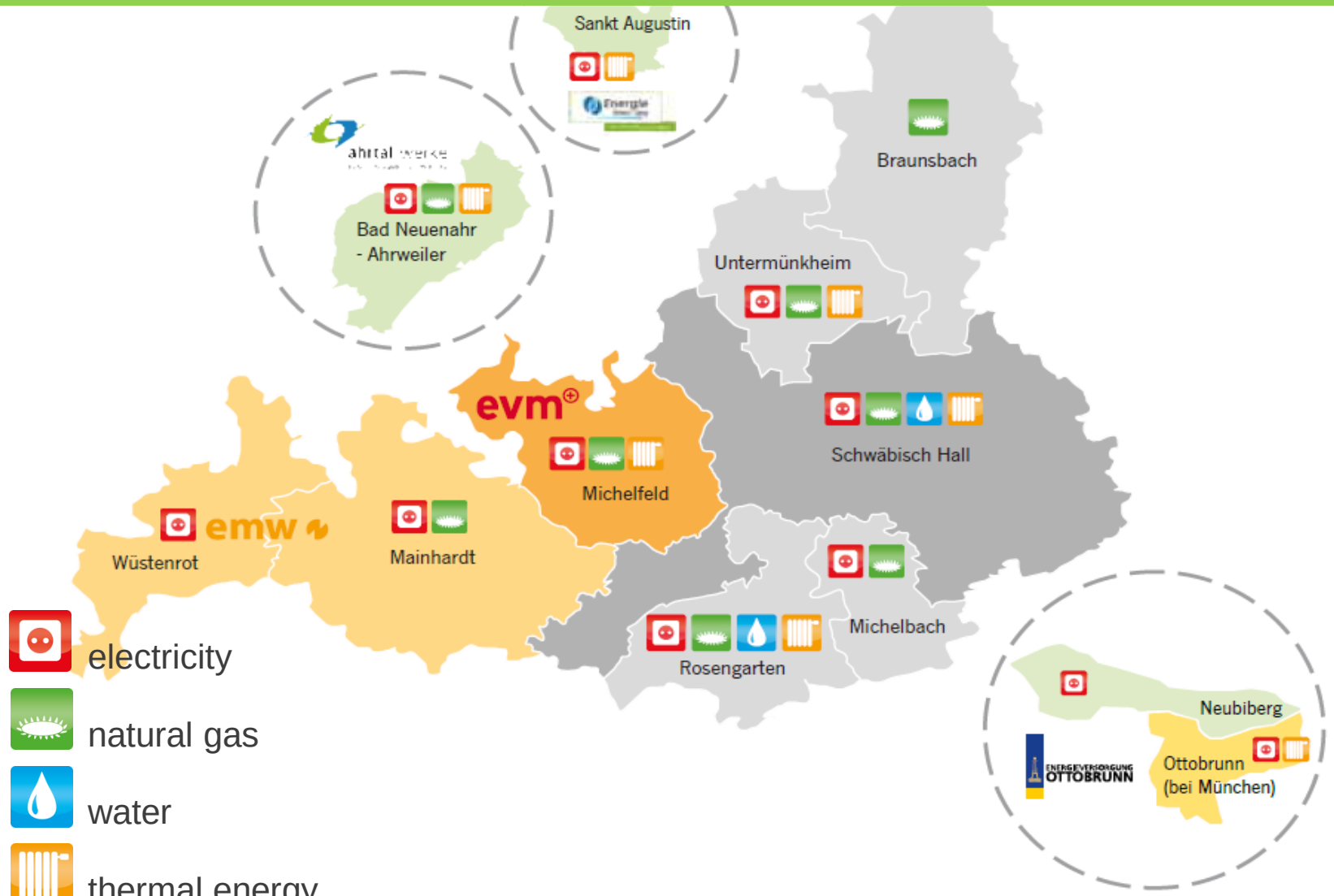
RE Energy

PV Power Plant	53.1	MW
Hydro Power:	2.5	MW
Windpower:	27.8	MW
Biowaste:	27,0	MW

the owner is the commune from SHA/all people

stadtwerke Schwäbisch Hall GmbH

concession area Stadtwerke Schwäbisch Hall GmbH 70.000 inhabitants are living in the grid Schwäbisch Hall



indoor swimming pool

stadtwerke Schwäbisch Hall GmbH

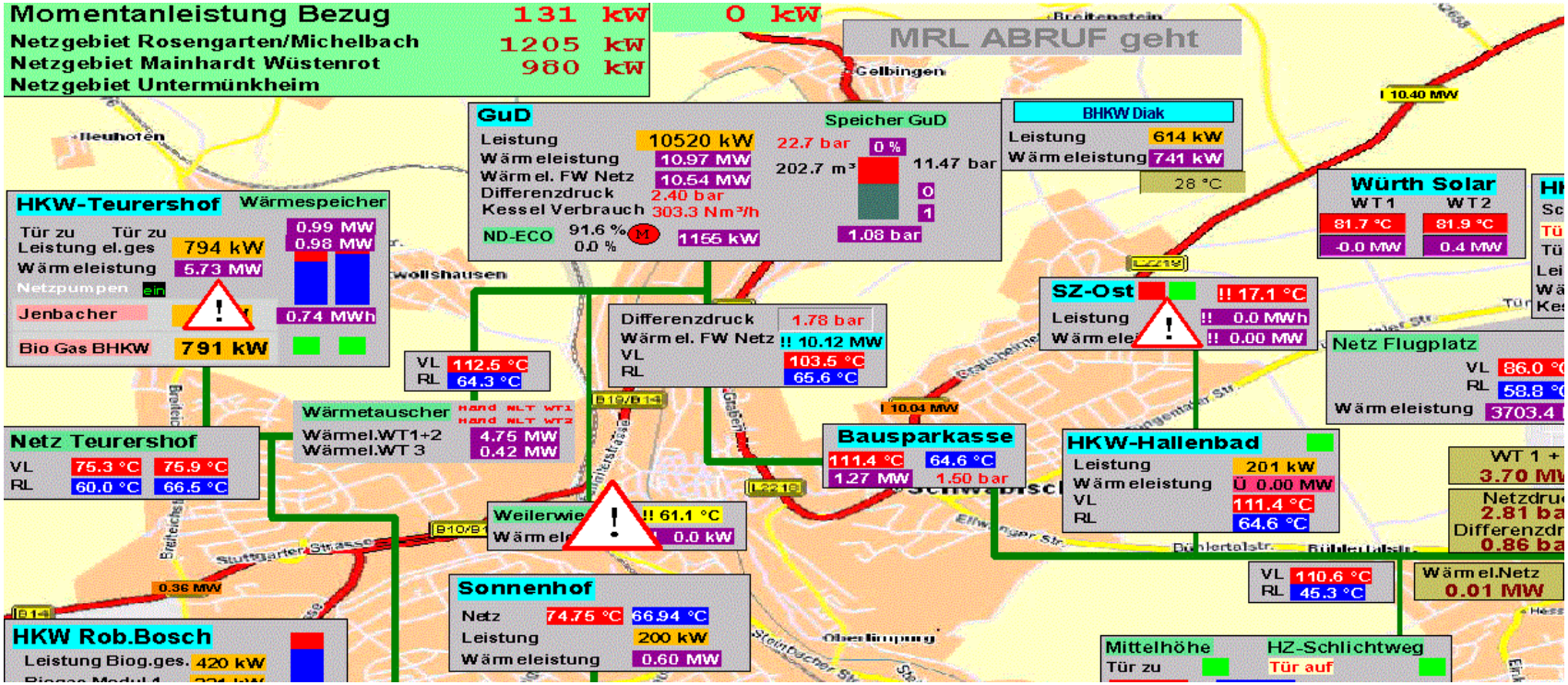
car parking

sauna park

Windfarm

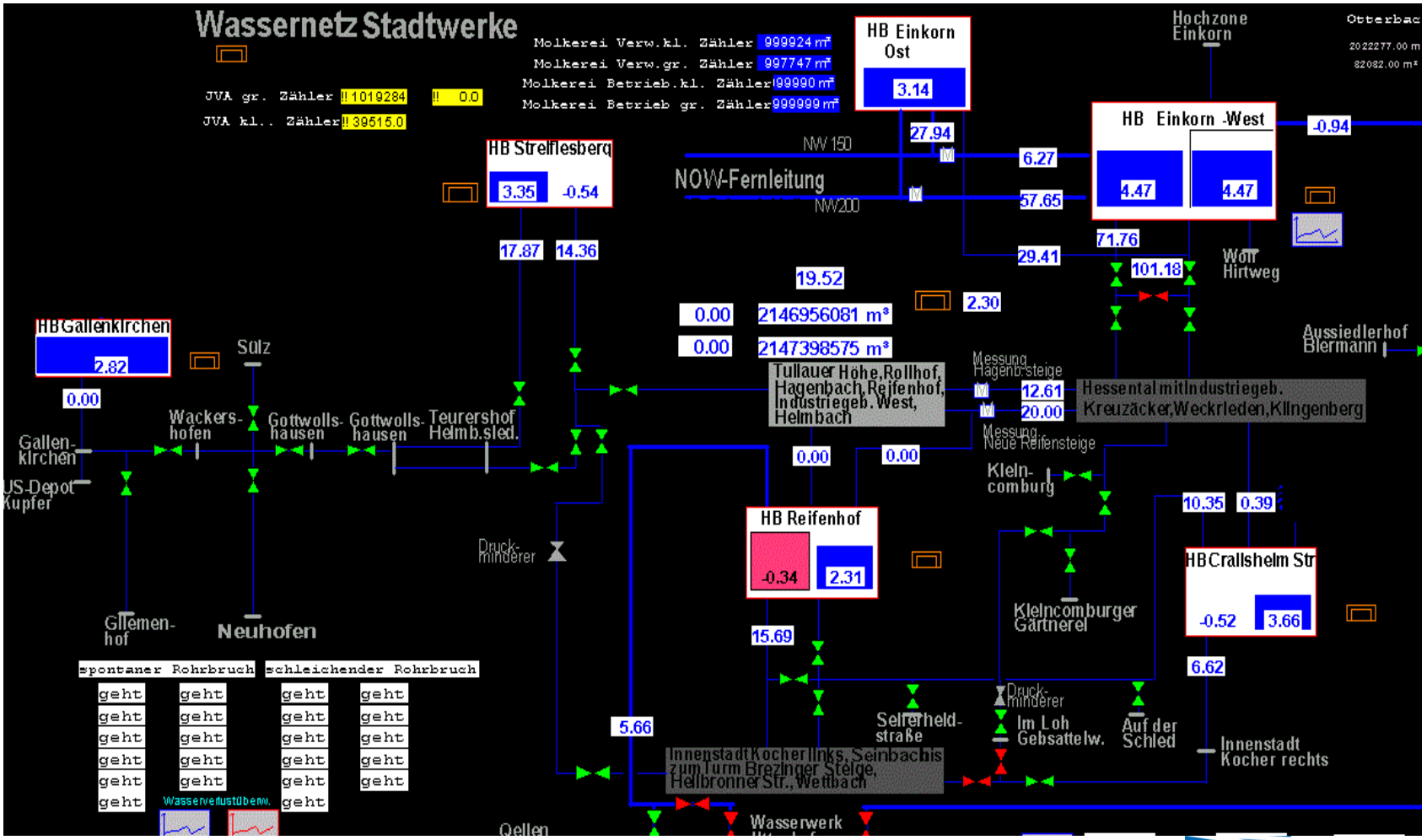
CHP with hot water storage

heat grid, the distance is about 15000 m, a hospital and big buildings are connected to the grid (cooling and heating) cooling with adsorption in the facilities



stadtwerke Schwäbisch Hall GmbH

grid with water storage; water grid control;
for spring /use chlorine dioxid

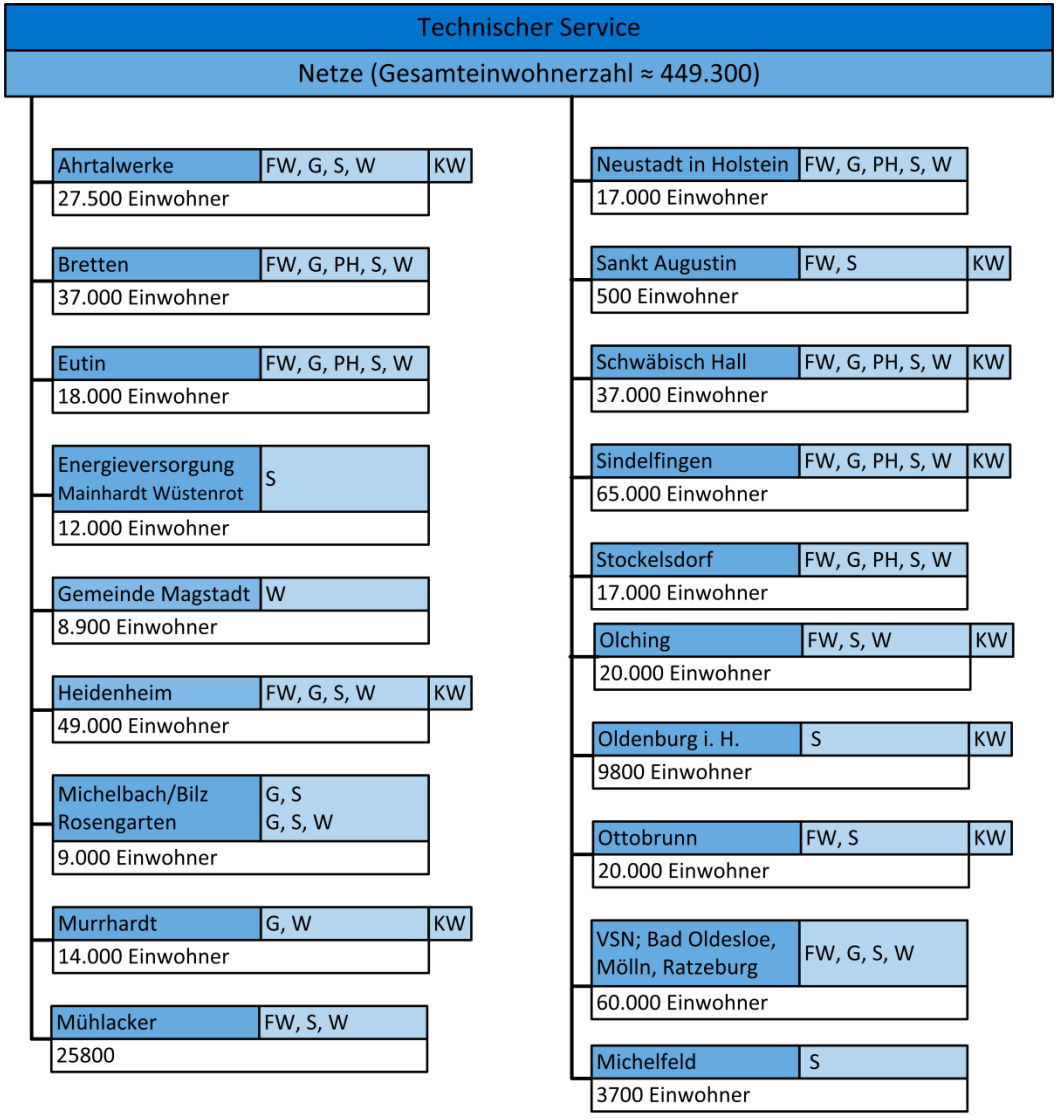


Service customers department Grid Control Engineering

1 Ahrtahlwerke
2 Energieversorgung Mainhardt/Wüstenrot
3 Stadtwerke Olching
4 Energieversorgung Ottobrunn
5 Stadtwerke Bretten
6 Stadtwerke Buchen
7 Stadtwerke Eberbach
8 Stadtwerke Eutin
9 Stadtwerke Heidenheim
10 Stadtwerke Magstadt
11 Stadtwerke Mühlacker
12 Stadtwerke Murrhardt
13 Stadtwerke Neustadt in Holstein
14 Energie-Rhein-Sieg
15 Stadtwerke Schwäbisch Hall
16 Stadtwerke Sindelfingen
17 Gemeindewerke Stockelsdorf
18 Vereinigte Stadtwerke Netz
19 Stadtwerke Oldenburg in Holstein
20 Energieversorgung Michelfeld

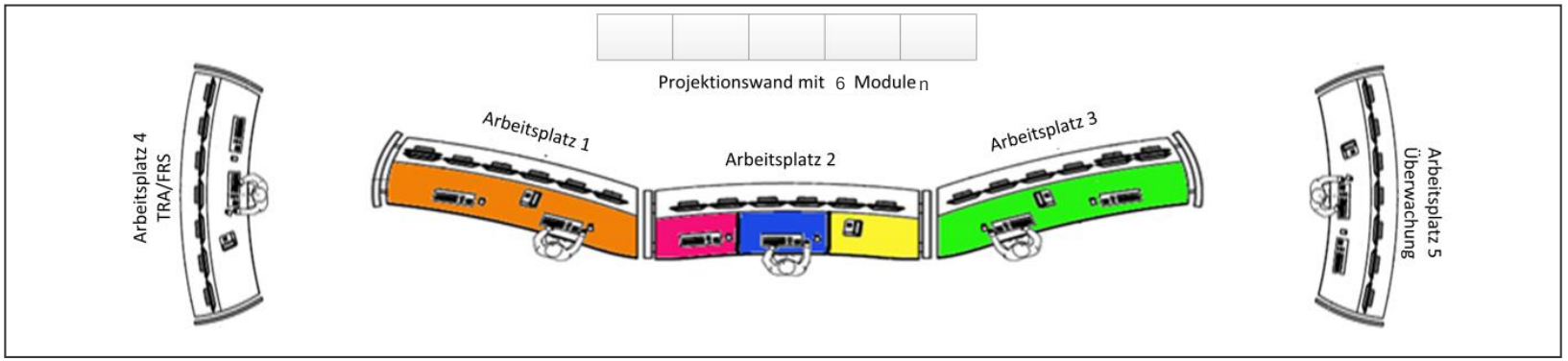
stadtwerke Schwäbisch Hall GmbH

20 Customers with 450.000 inhabitants



stadtwerke Schwäbisch Hall GmbH

Multi utility control room at Stadtwerke Schwäbisch Hall



stadtwerke
Schwäbisch Hall GmbH

First multi utility Company—CERTIFIED GRID CONTROL

Since June 2014

ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Management Service

ZERTIFIKAT

Die Zertifizierungsstelle
der TÜV SÜD Management Service GmbH
bescheinigt, dass das Unternehmen

stadtwerke Schwäbisch Hall GmbH

Stadtwerke Schwäbisch Hall GmbH
An der Limpurgbrücke 1
74523 Schwäbisch Hall
Deutschland

in den Bereichen

Leitstellensicherheit und Netzbetriebsführung

erfolgreich geprüft wurde.
Durch ein Audit wurde der Nachweis erbracht,
dass die Forderungen des

TÜV MS Standards Zertifizierte Netzbetriebsführung

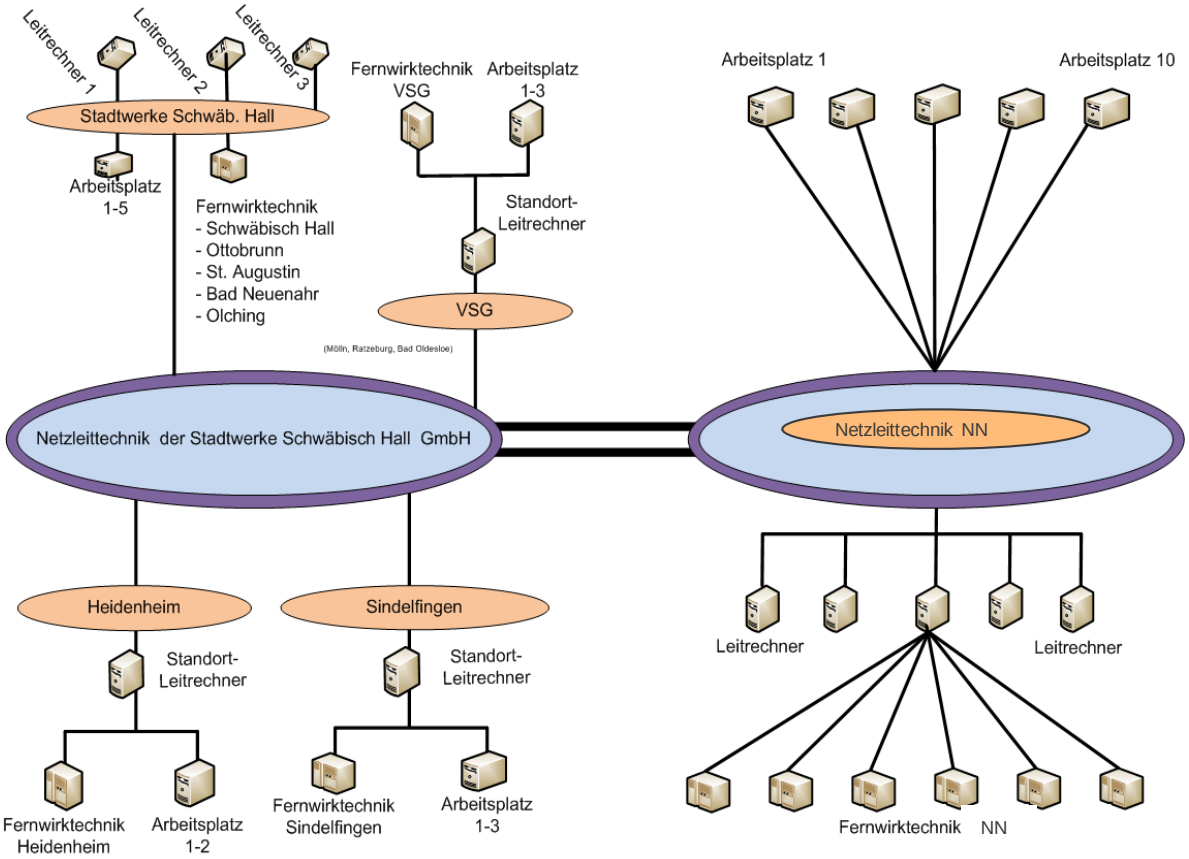
hinsichtlich Sicherheitspolitik, Prozesse des Leitstellensicherheitsmanagementsystems, Risikomanagement und hinsichtlich Organisation, Personal und Technik erfüllt sind.
Dieses Zertifikat ist gültig vom **2014-06-12** bis **2017-06-11**.
Zertifikat-Registrier-Nr. **12 730 48110 TMS**

Product Compliance Management
München, 2014-06-17

TÜV SÜD Management Service GmbH • Zertifizierungsstelle • Ridlerstraße 65 • 80339 München • Germany

stadtwerke Schwäbisch Hall GmbH

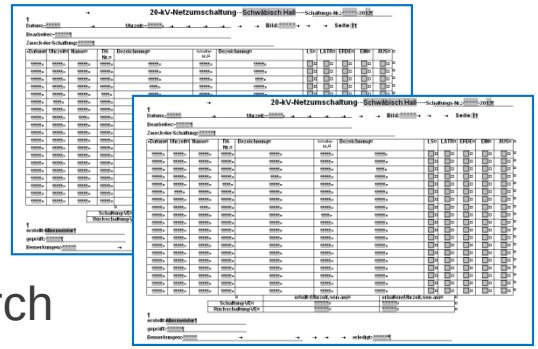
Integration of business partners



- reliability through redundant grid control centers
- increased workforce flexibilty due to sharing of tasks
- crisis-proof concept

stadtwerke Schwäbisch Hall GmbH

SCADA and EMS/DMS-functions control room Schwäbisch Hall (partly)



Switching orders

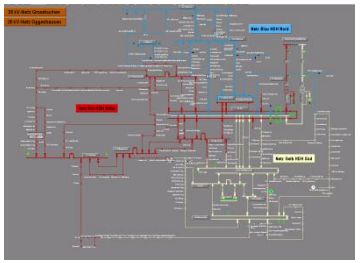
Voltage tracking topology

Automated short circuit and ground fault search

Check of switching registration and simulation with conditional clearance of interlocking functions

Updating of switching states (medium voltage)

Execution of 110-, 20-, 10- und 1 kV switching processes



SCADA – Supervisory Control and Data Acquisition

EMS – Energy Management Systems

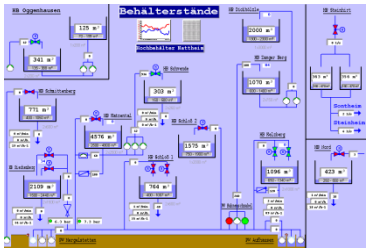
DMS – Distribution Management Systems

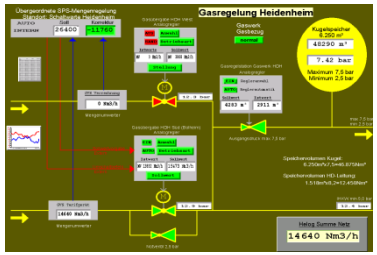
SCADA and EMS/DMS-functions control room Schwäbisch Hall (partly)

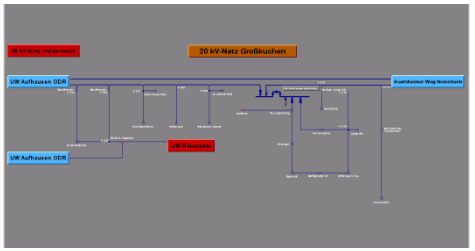
real-time power flow calculations in 20-kV-networks in monitoring system

Coupling-check of diffrent grid cells, e.g. in 1 kV-level

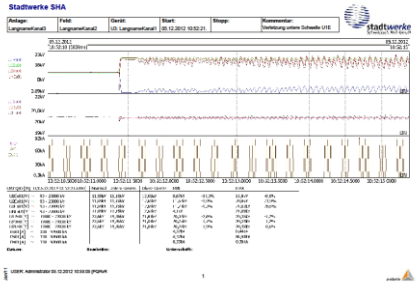
Monitoring of facilities and grids(power, gas, water, district heat, power plants)







Monitoring of power quality (10kHz sampling)



Remote analysis and parameterisation

of protection systems

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TOP 2 we need a new system without carbon and nuklear

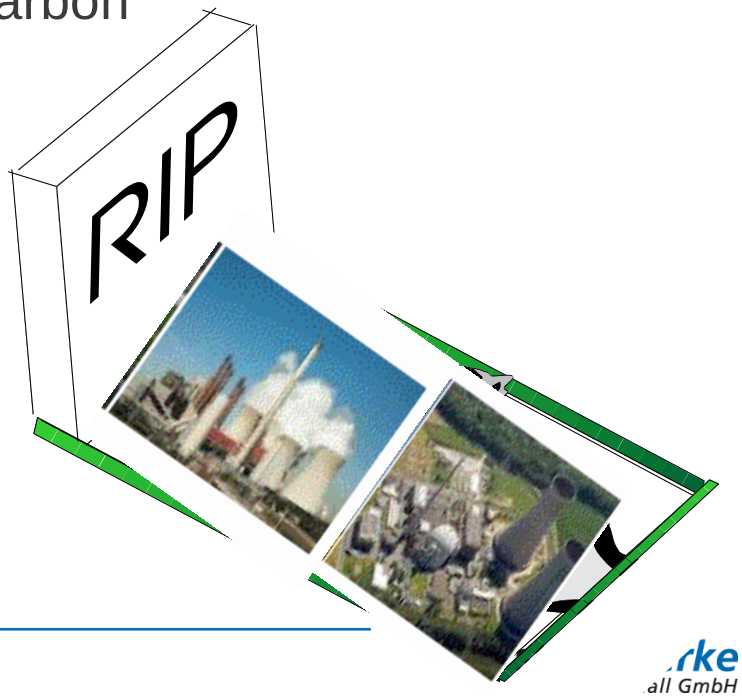
1)Smog

2)Carbon dioxid

3)Weather world wide (the year 2015),a lot of people lost her life, house

4)The next generations need also öl,gas, carbon

5)Fukushima,Harisburg,Tschernobil…



USA, a lot of people are dying

Wieder Dutzende von Toten nach schweren Wirbelstürmen – Notstand in 7 US-Staaten

BY **ADMIN** – POSTED ON 28. APRIL 2011

POSTED IN: **HAARP**, **KLIMATERROR**, **WETTERKRIEGE**

Eine Serie von schweren Wirbelstürmen hat im Süden der USA eine Spur der Verwüstung hinterlassen. In sieben Bundesstaaten wurde der Notstand ausgerufen.

India – a big desaster in chennai

Heftige Regenfälle in Südindien

Drei Meter Hochwasser in Chennais Strassen

Nach den stärksten Regenfällen seit Jahrzehnten stehen weite Teile im Süden Indiens unter Wasser. Zehntausende sitzen in ihren Häusern fest. Ein Flughafen wurde geschlossen.

2.12.2015, 11:29 Uhr

Smog China,Italy,Deli

TOP 3 Europe and Germany

systems and players

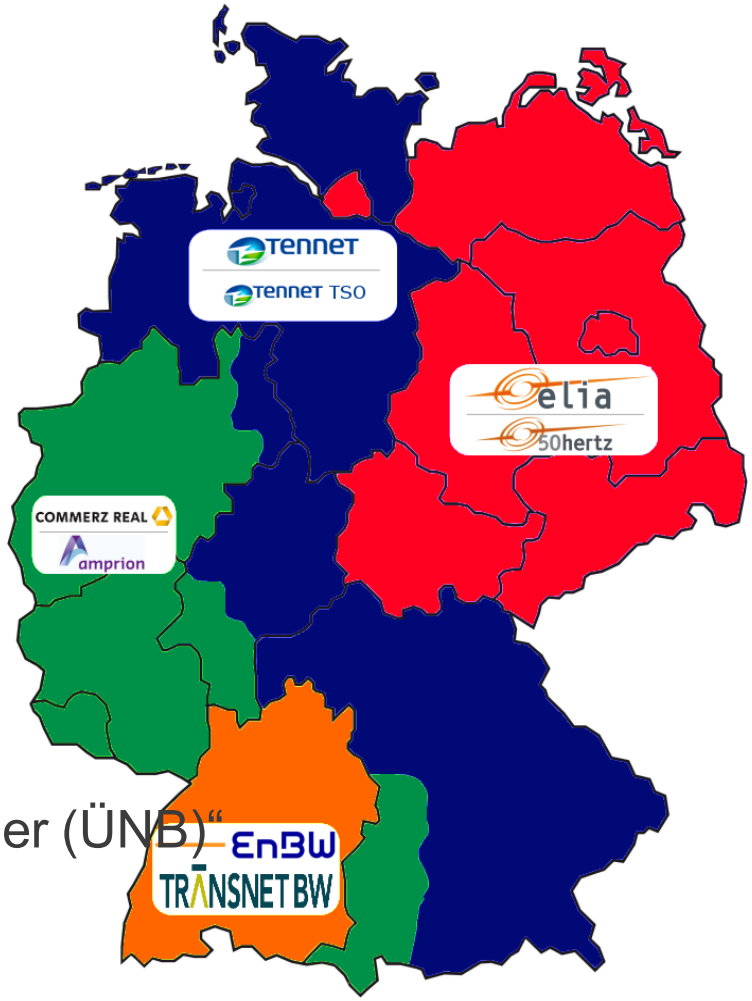
TSO in Europe and Germany

European Network of Transmission System Operators for Electricity (ENTSO-E)

- 41 Transmission System Operator* (TSO) in 34 Countries

German TSO

- Amprion GmbH
- Tennet TSO GmbH
- TransnetBW GmbH
- 50Hertz Transmission GmbH



* in Germany TSO - „Übertragungsnetzbetreiber (ÜNB)“

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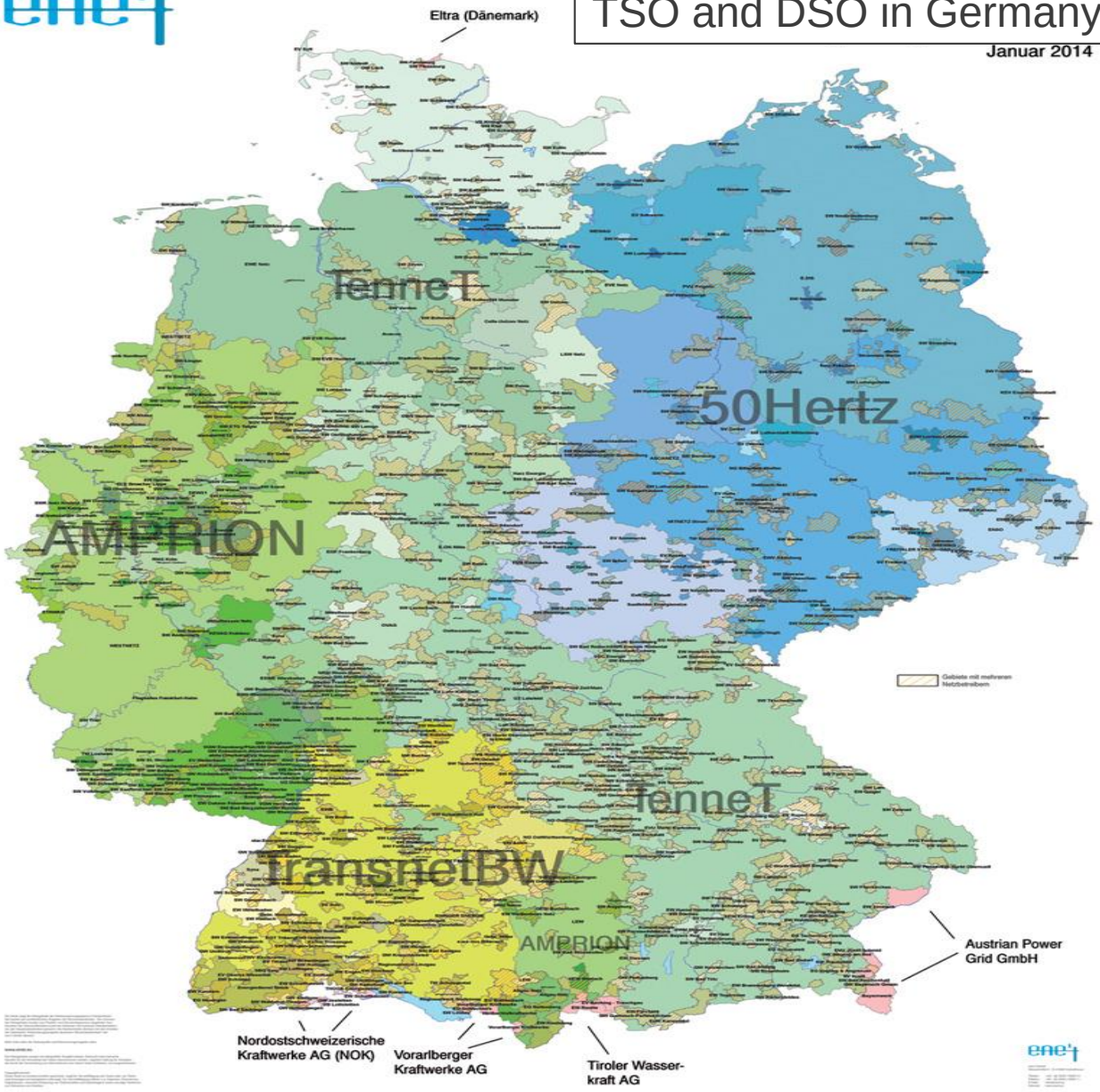
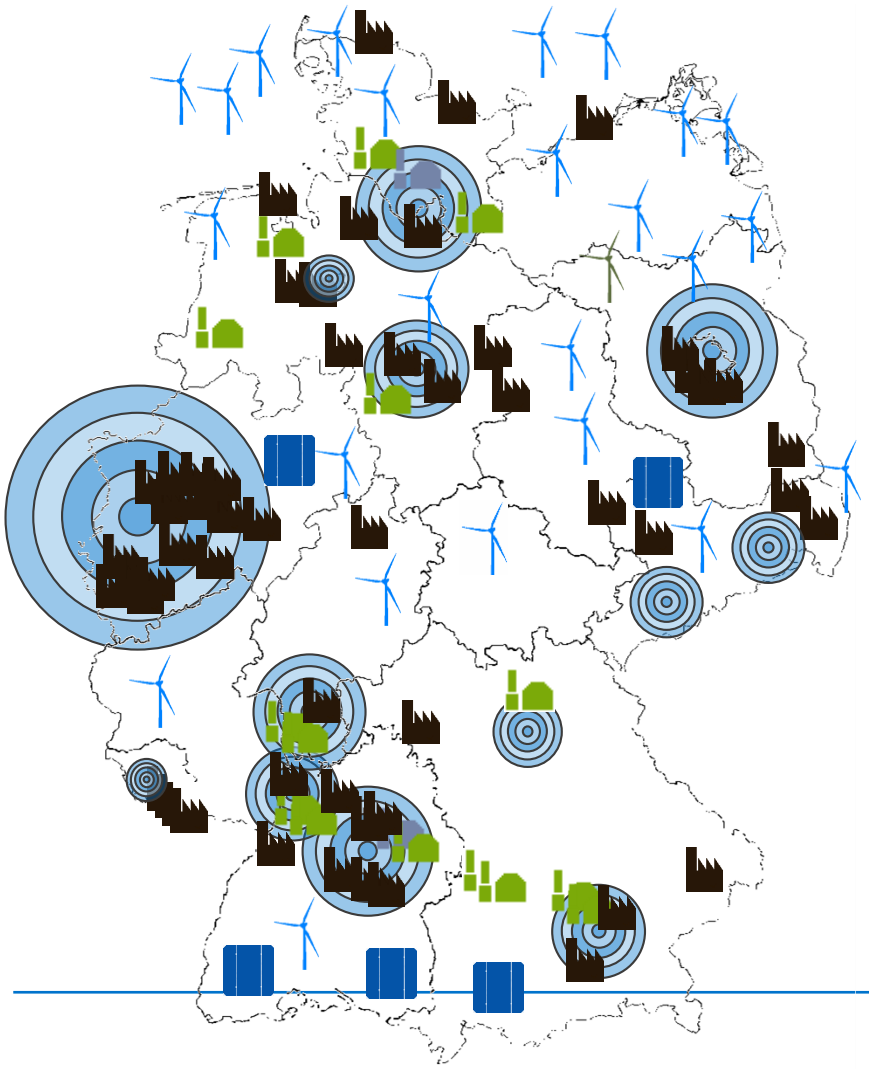
TSO and DSO in Germany



The electrical power supply is chanching



Region with a lot of people

Atomic power plant

Coal-fired power station

Windpower

Photovoltaiks
(Region with high Power)

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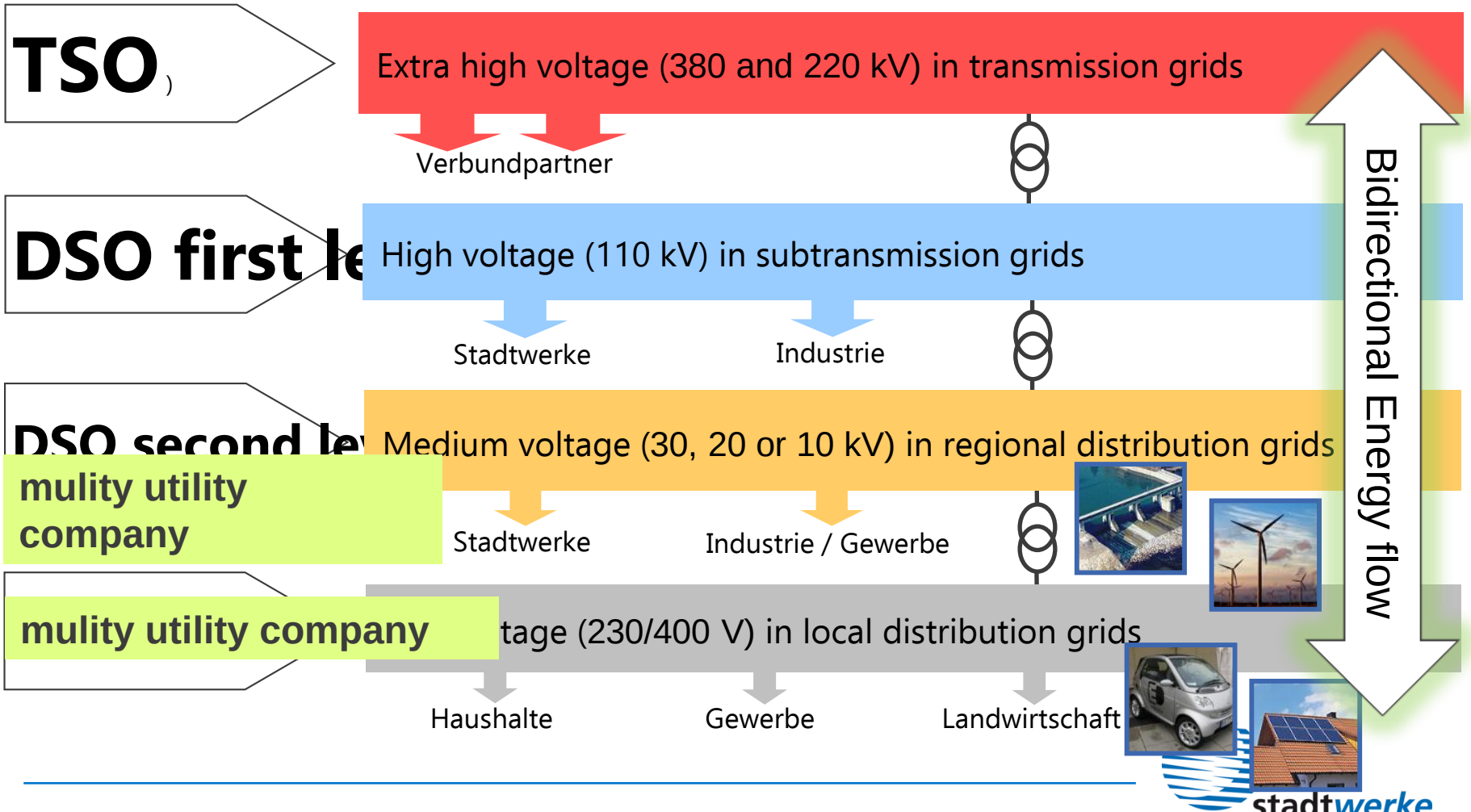
Energy flows in between the voltage levels with (renewable) DER



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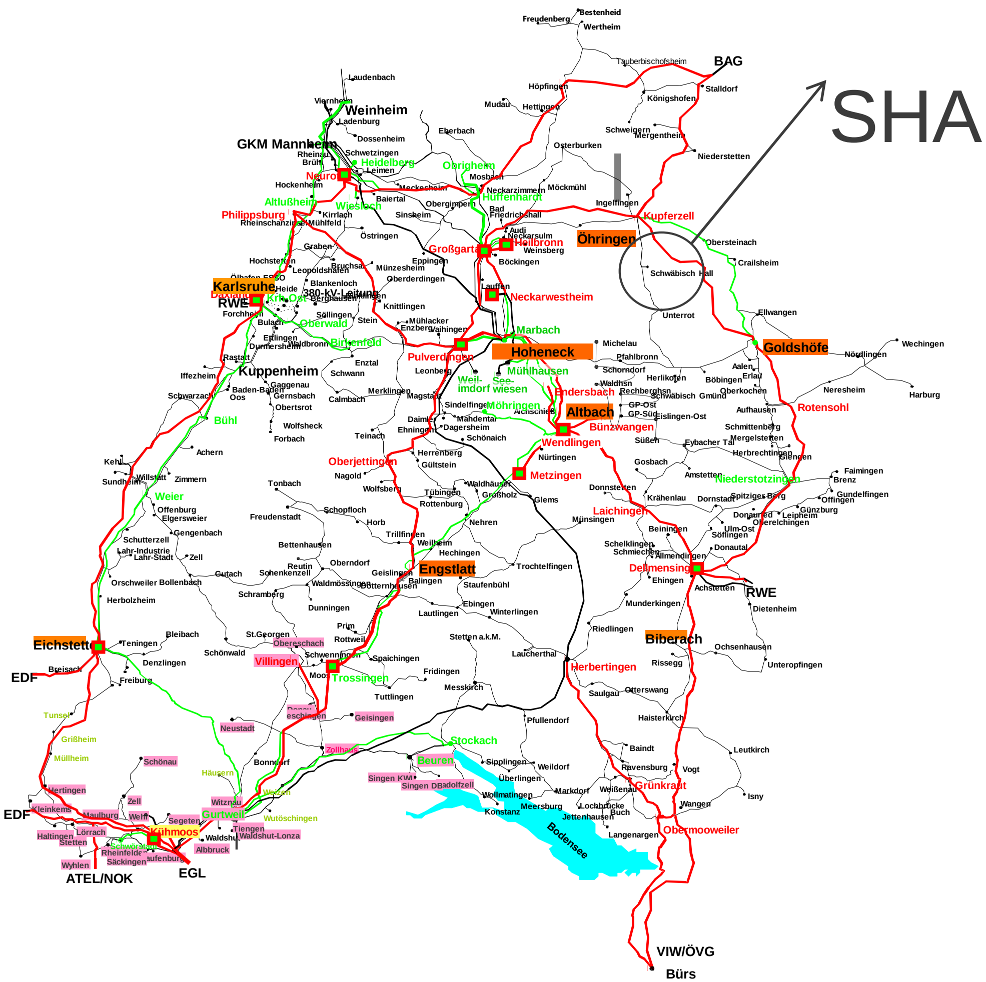
The region from TSO Transnet /Schwäbisch Hall is a part from this Grid



Höchstspannungsnetz:
3.700 km 380- und 220-kV-Leitungen
46 Umspannwerke 380/220/110 kV

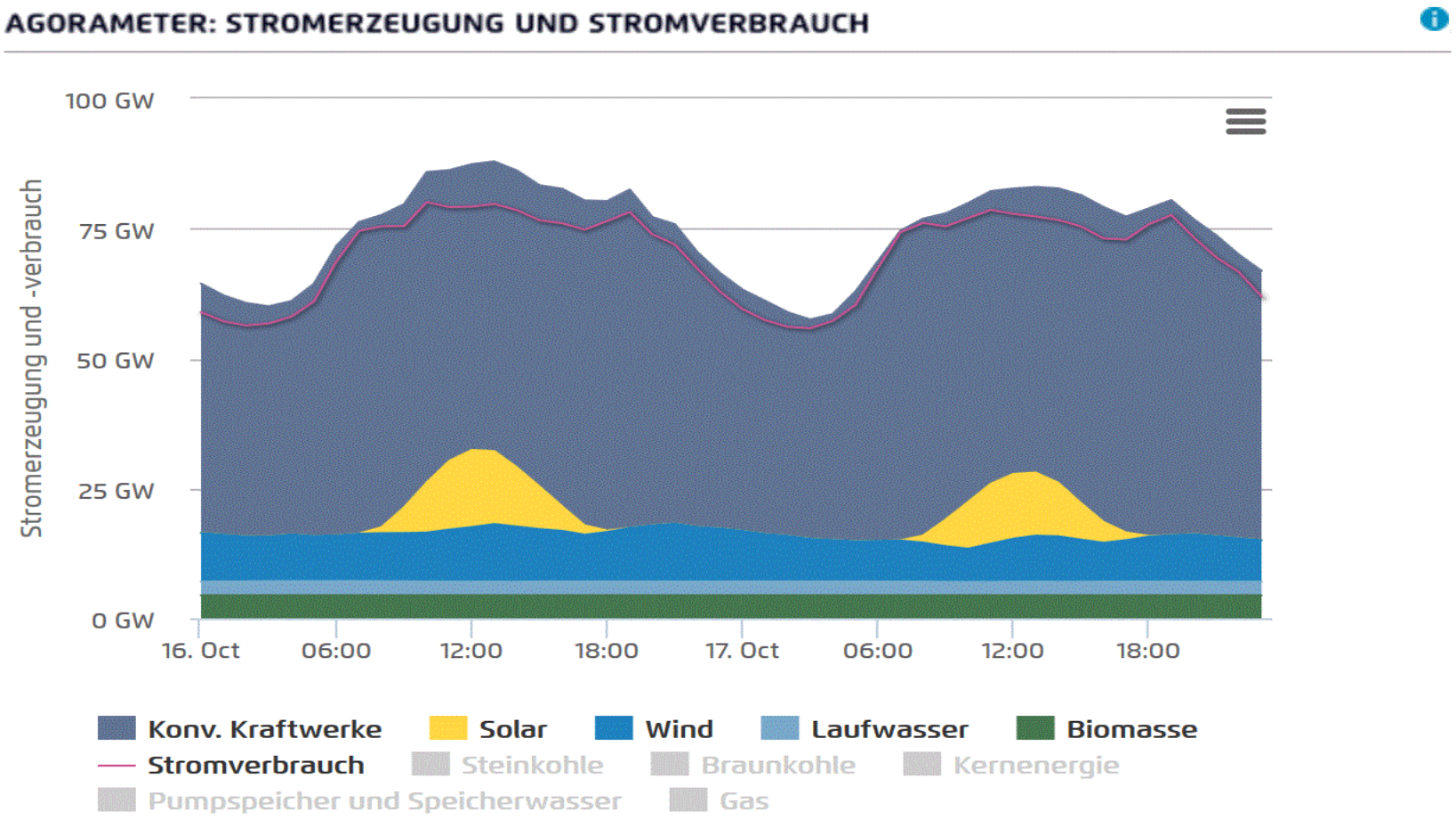
Hochspannungsnetz:
7.600 km 110-kV-Leitungen
390 Umspannwerke 110/30/20/10 kV
671 Transformatoren

Mittelspannungsnetz:
29.800 km 30-, 20- und 10-kV-Leitungen
40.000 Umspannstationen 30/20/10/0,4 kV

Niederspannungsnetz:
66.700 km 0,4-kV-Leitungen

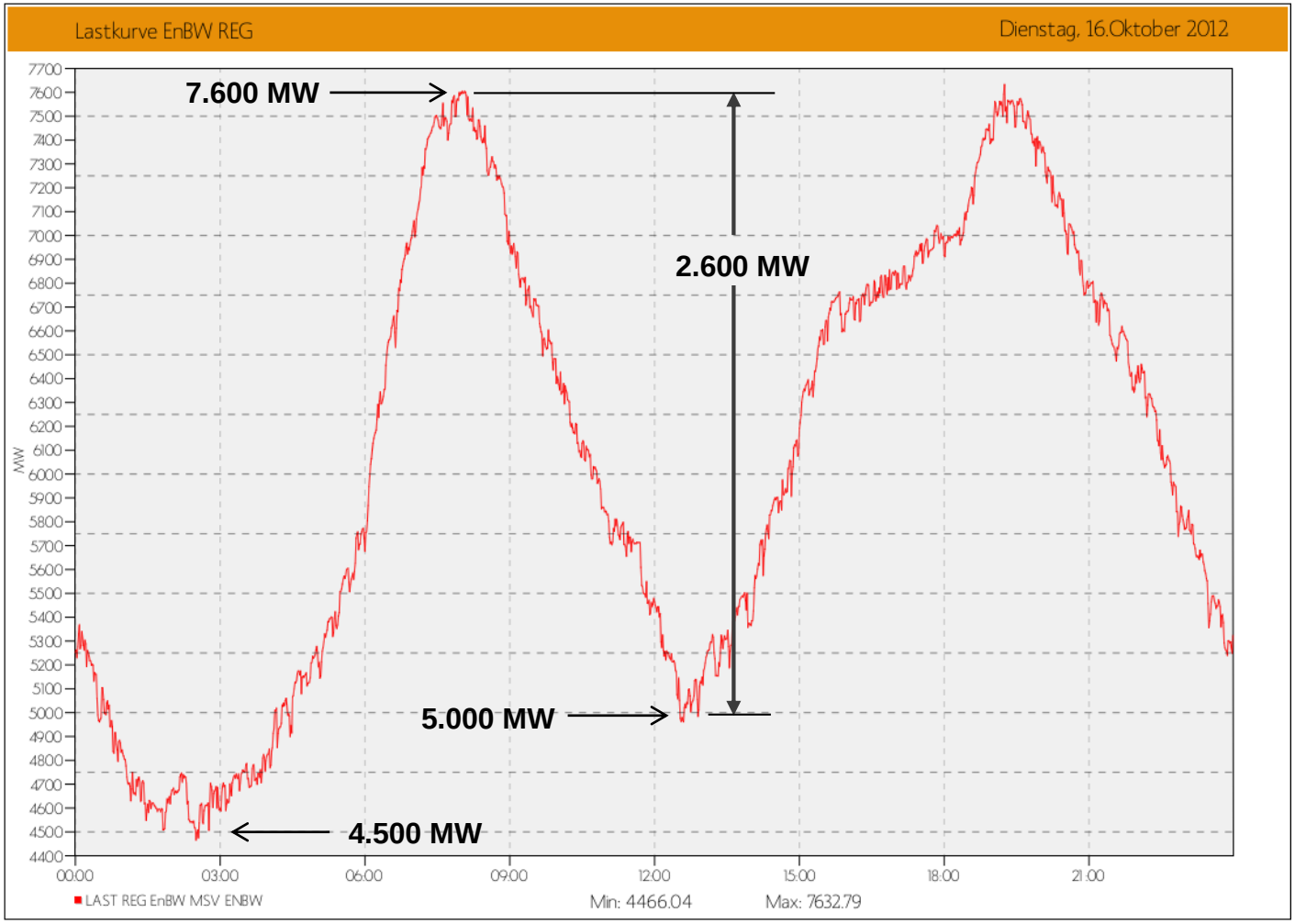
380 kV
220 kV
110 kV

Gridpower Germany 16.10.2012

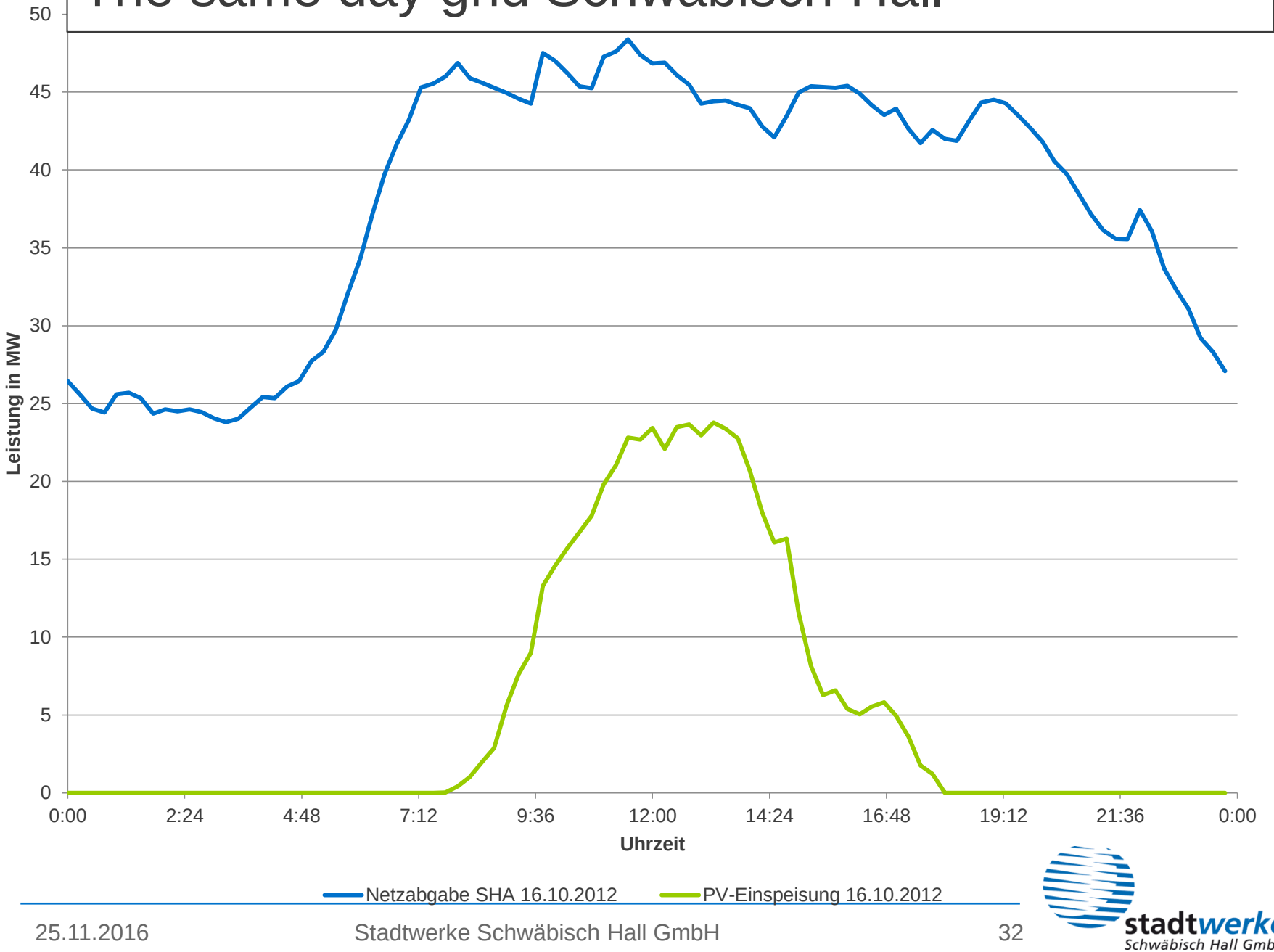


Agora Energiewende; Stand: 13.11.2014, 10:45

Grid-Power TSO transnet BW
Thuesday, 16.10.2012, sunny day



The same day grid Schwäbisch Hall



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Power plants Grid Schwäbisch Hall (renewable Energy 100 MW (>100 %)

emergency power system (EPS): a total of 7 MW

combined heat and power (CHP): a total of 21 MW

wind power: a total of 28 MW

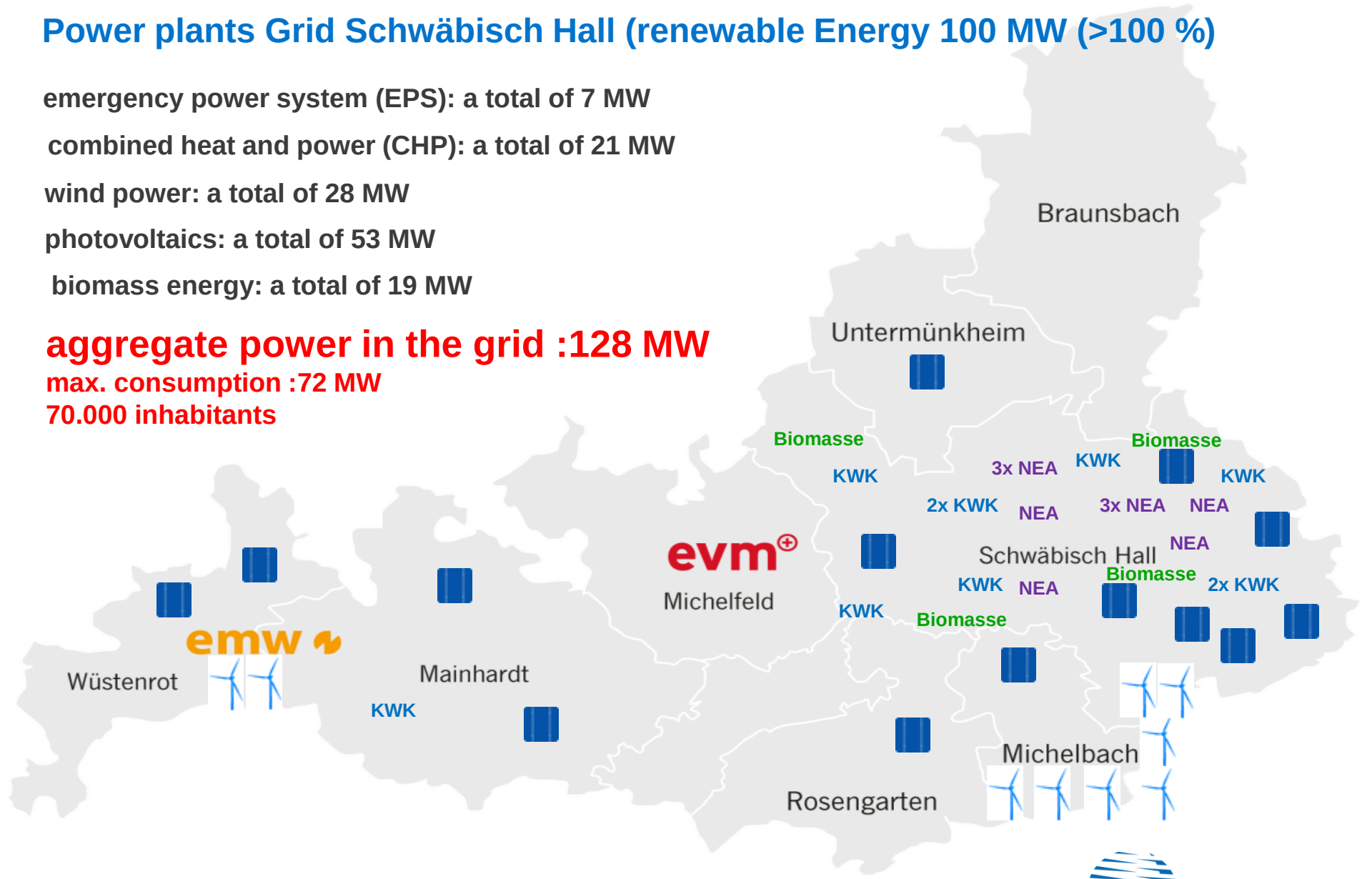
photovoltaics: a total of 53 MW

biomass energy: a total of 19 MW

aggregate power in the grid :128 MW

max. consumption :72 MW

70.000 inhabitants



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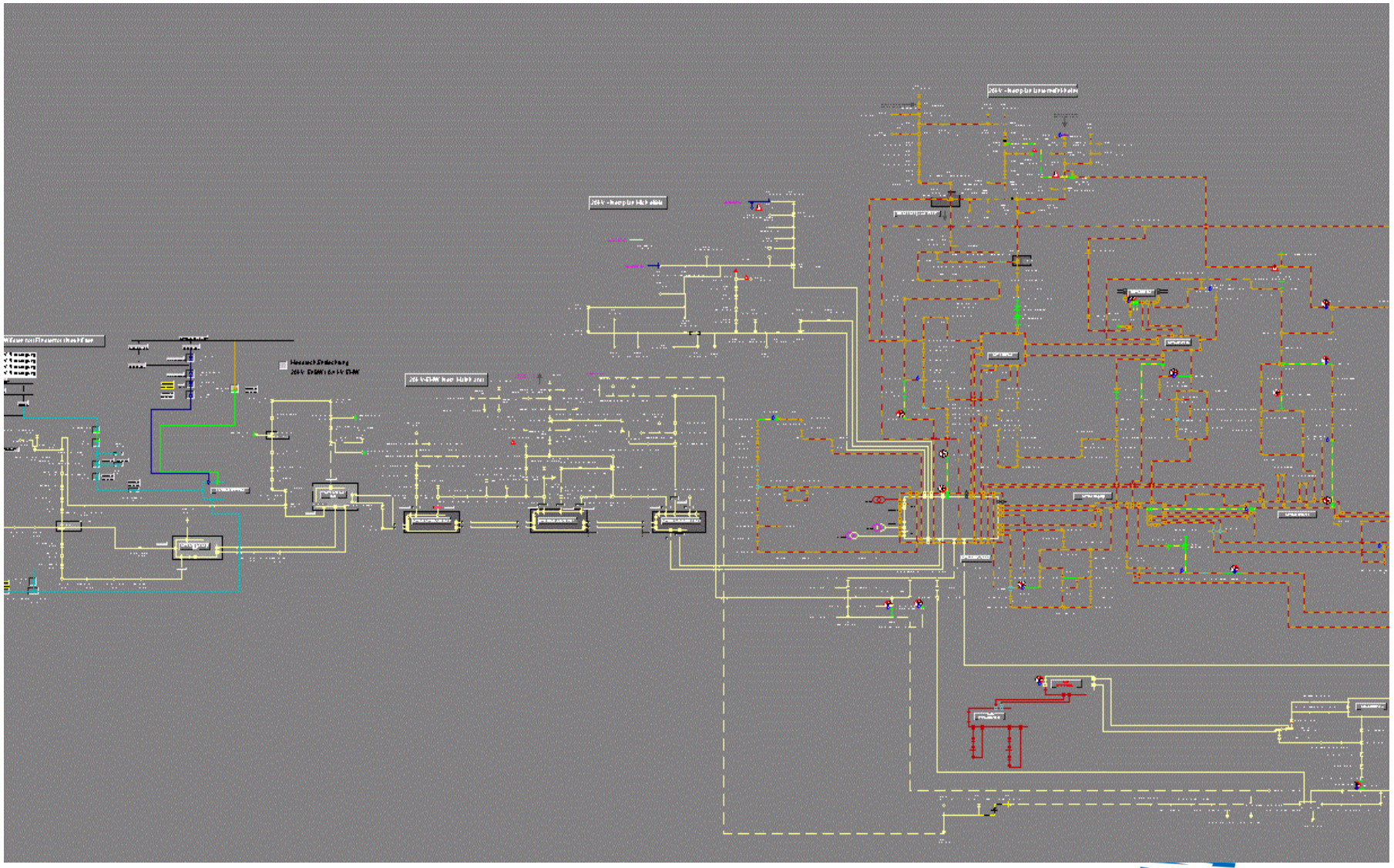
Electrical Grid Company Schwäbisch Hall



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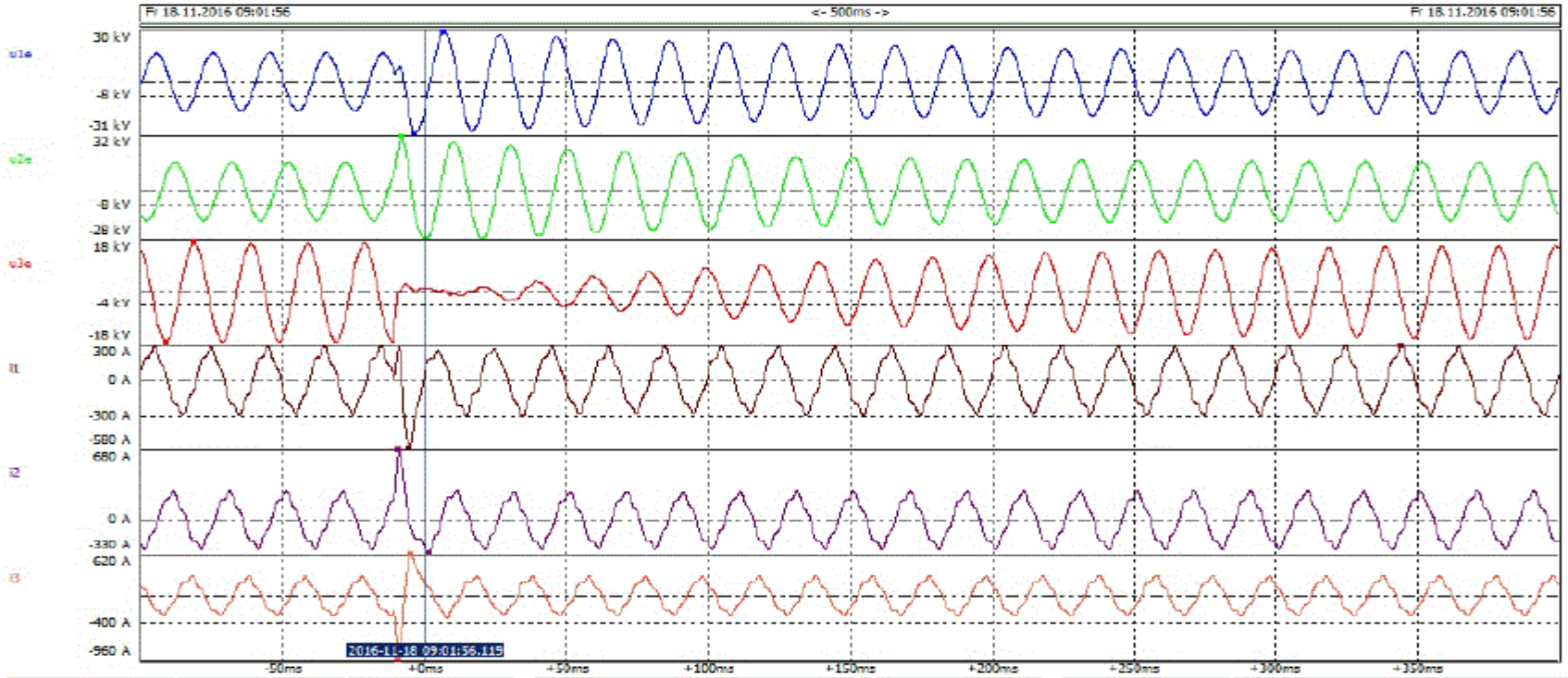
earth fault in the grid phase 3

Kommentar: AutoReport Anlage: SWRobert - U3_SW_Robert_Bosch Feld: U3_SW_Robert_Bosch -	Trigger: 2016-11-18 09:01:56.119 Verletzung untere Schwelle U3E Transnostik: Kurzschluss L3-E hinter der Mess-Stelle (eigenes Netz)	SHA Oszilloskop	stadtwerke Schwäbisch Hall GmbH



	Minimum	Maximum
U1E	-30,3 kV / -255,7 %	29,2 kV / 246,7 %
U2E	-27,1 kV / -229,4 %	31,4 kV / 265,6 %
U3E	-17,1 kV / -144,6 %	17,1 kV / 144,7 %
une	-	-

	Minimum	Maximum
u12	-	-
u23	-	-
u31	-	-

UCLL=20,5 kV - Stördauer=0ms

	Minimum	Maximum
I1	-572,6 A	292,4 A
I2	-320,4 A	678,7 A
I3	-952,2 A	616,5 A
in	-	-

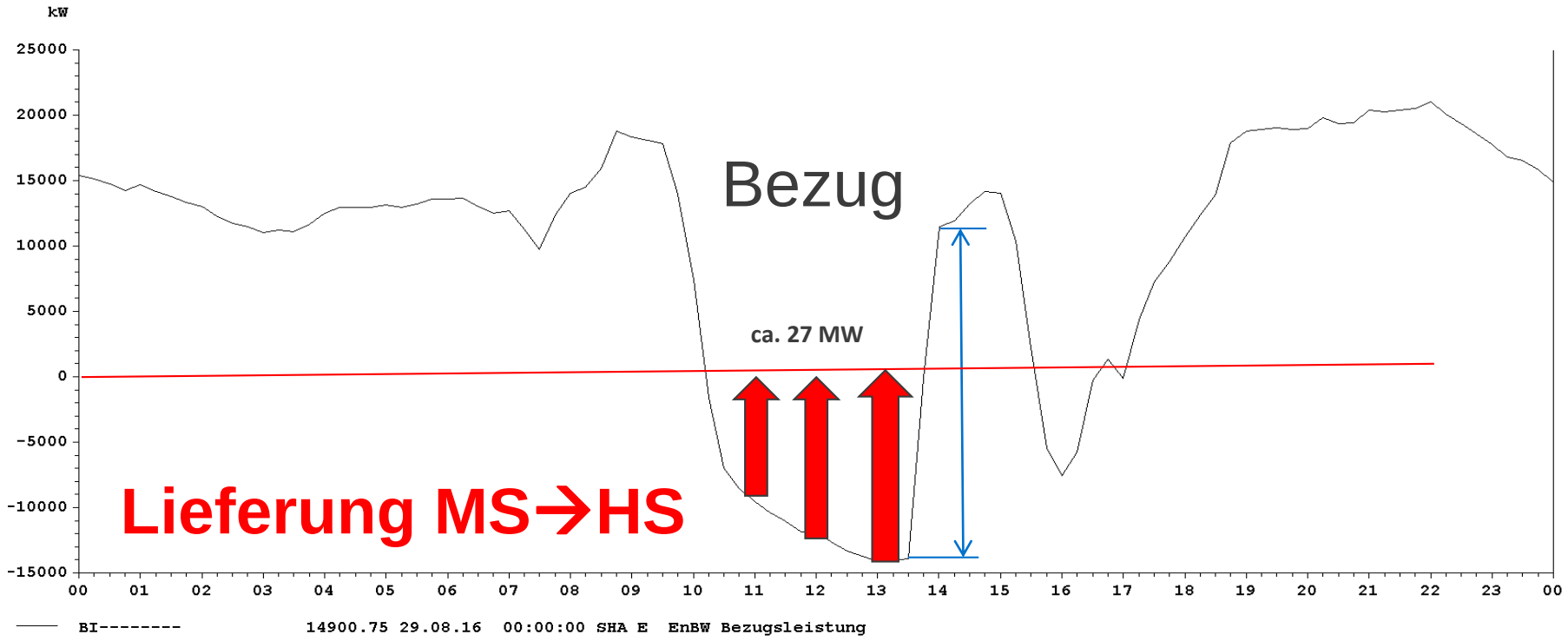
1 / 1	STADTWERKE-HALL/SYSTEM (18.11.2016 09:05:05)	a-eberle

Grid soloution

- load reversal 0.4 kV → 20 kV → 110 kV
- New grid protection
- online grid control check with our grid control systems

Soloutions for grids

energy flow from 20 kV to 110 kV , 27 MW in one minute
30 % from the maximun



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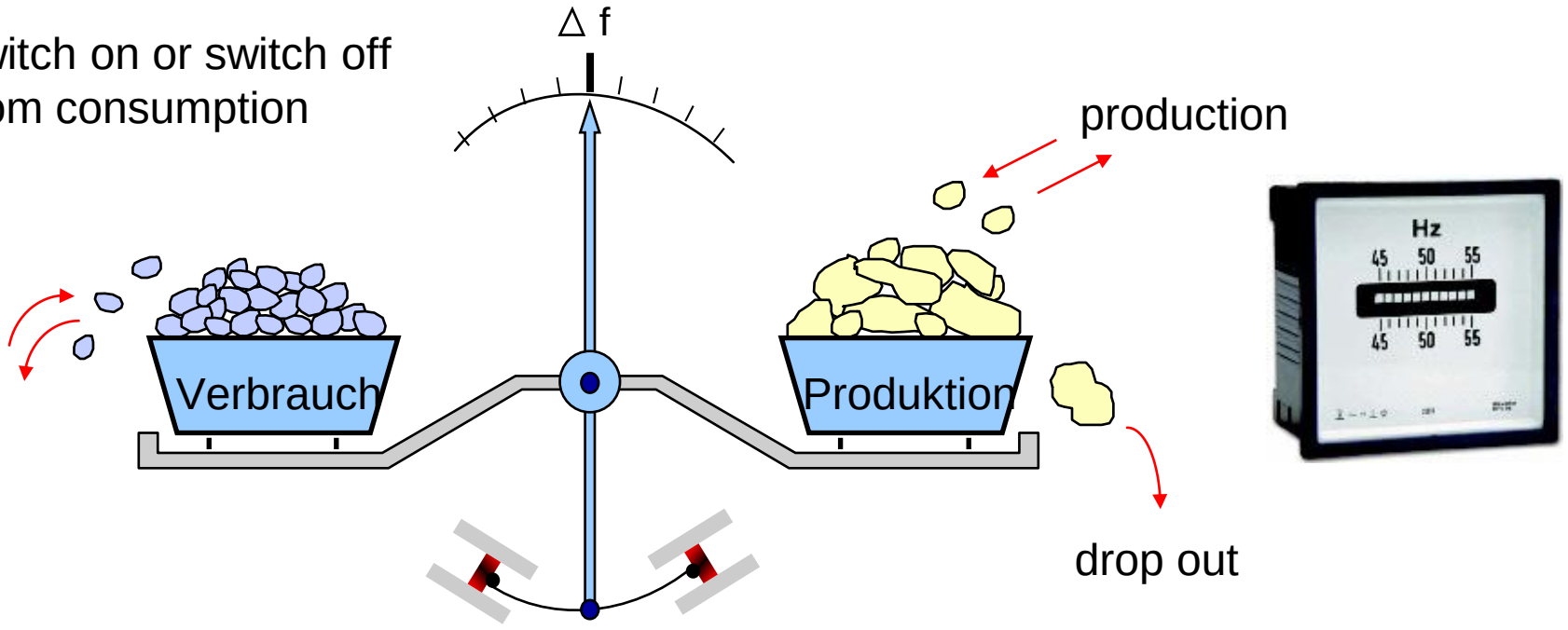
remember: 100 % renewable ist posible

we must change the management let‘s go

requirement for grid stability

- production and consumption must be in balance
- power frequency is the indicator

switch on or switch off
from consumption



we need synchronous generator
(nimmt wegen zunehmender Stromeinspeisung aus PV-Anlagen ab)

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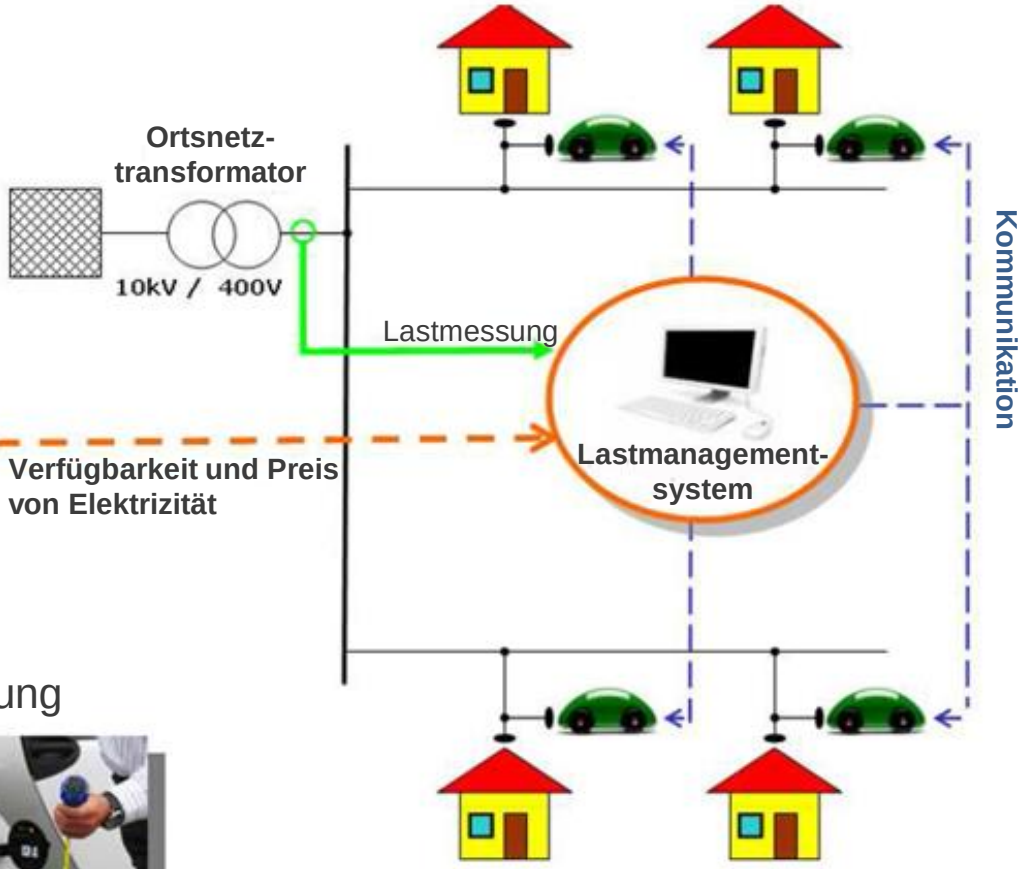
example for a new grid management

Netzleitstelle



Kommunikation
Über Steckverbindung

stadtwerke Schwäbisch Hall GmbH

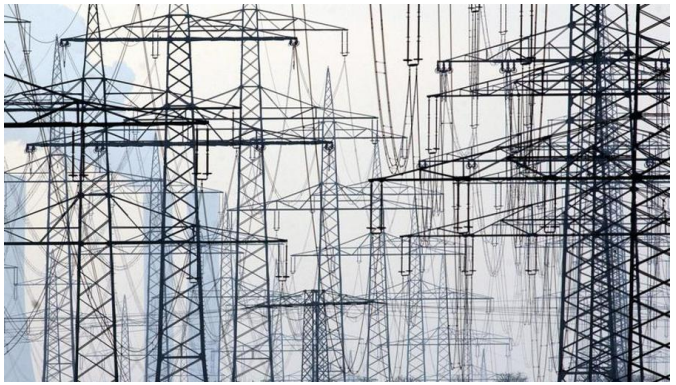
germany rules for grids

- § 13 Abs. 1 EnWG

  Übertragungsnetzbetreiber sind berechtigt und verpflichtet, sofern die Sicherheit oder Zuverlässigkeit **des Elektrizitäts-versorgungssystems** in der jeweiligen Regelzone gefährdet oder gestört ist, die **Gefährdung oder Störung** durch

  - 1. **netzbezogene Maßnahmen** und
  - 2. **marktbezogene Maßnahmen**

  zu beseitigen.



Quelle: www.n24.de/news/newsitem_533059.html

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the rules for electrical grids in Germany if we have to much power in the grid

regulation power grid

CHP

PV > 100 kW, biomass,hydro power, wind

iPLON® The Infranet Company

PV < 100 kW iPLON® The Infranet Company

§ 11 EEG

…Bei der Regelung der Anlagen nach Satz 1 sind Anlagen im Sinne des § 6 Absatz 2 erst nachrangig gegenüber den übrigen Anlagen zu regeln. Im Übrigen müssen die Netzbetreiber sicherstellen, dass insgesamt die größtmögliche Strommenge aus erneuerbaren Energien und Kraft-Wärme-Kopplung abgenommen wird.

stadtwerke Schwäbisch Hall GmbH

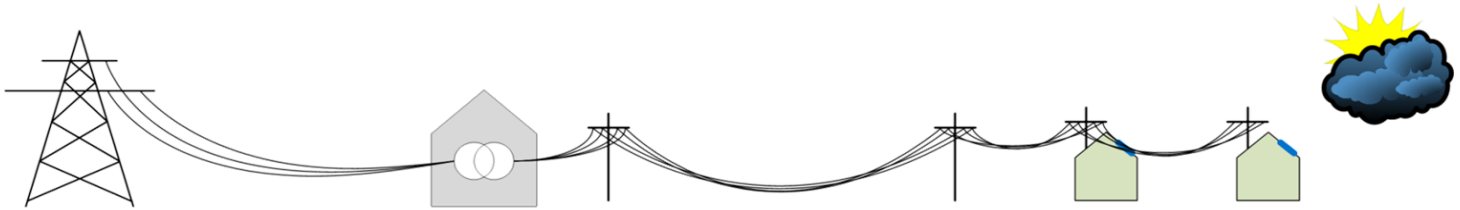
new business for power companies and grid designer (new job)

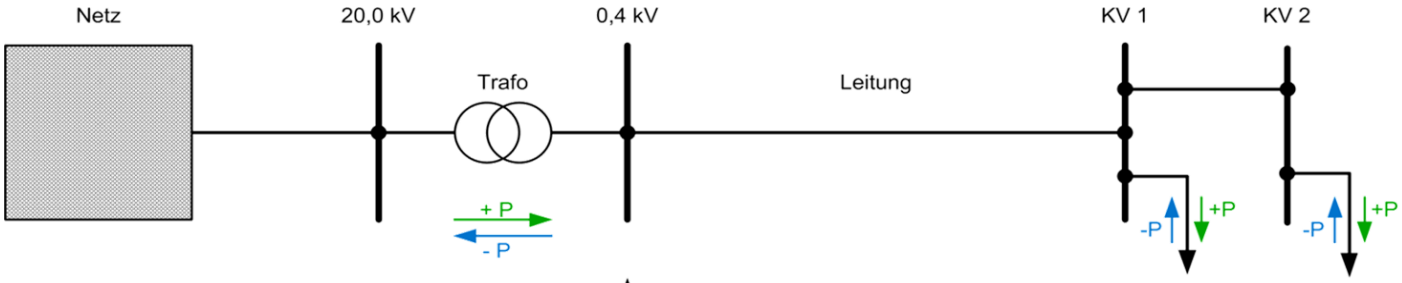
- → industrial automation power companies 4.0
- → more economy
- → more information

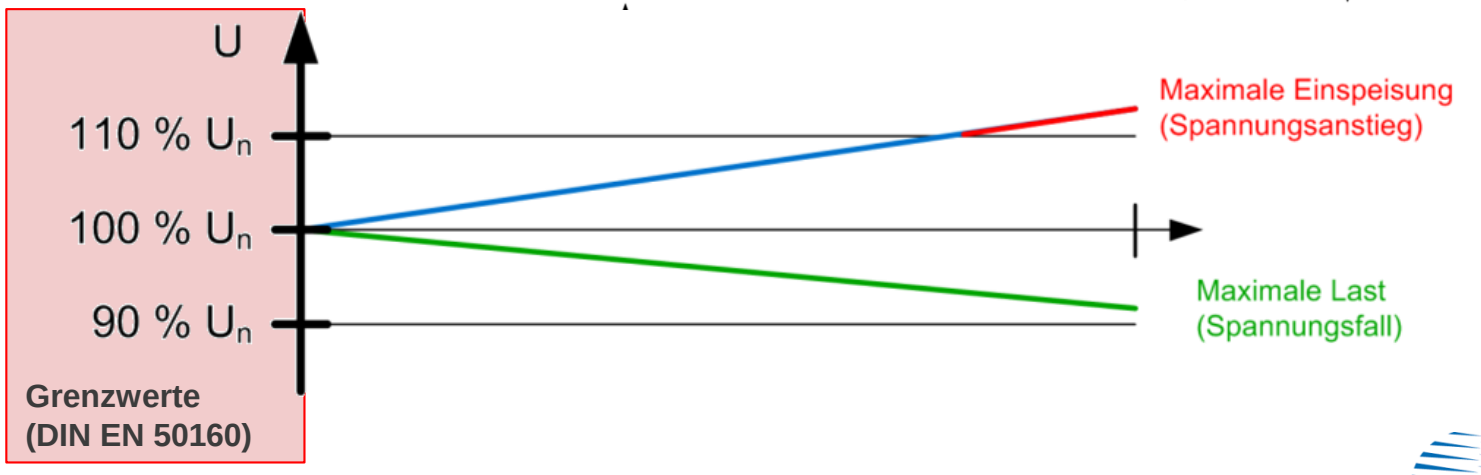
new concept

- not enough electrical power in the grids
- electric powered cars
- the customer make the electrical power by himself, we need new business
- the customer is autarkic

high voltage in the end of the grid







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grid stability voltage regulation with transformers

benefit

+ prove technology

+ low maintenance

+ save money

handicap:

- expencive (3:1)

GRIDCON® Transformer (Trafo) & iTAP® (Regeleinheit)
von Maschinenfabrik Reinhausen GmbH
Quelle: MR GmbH

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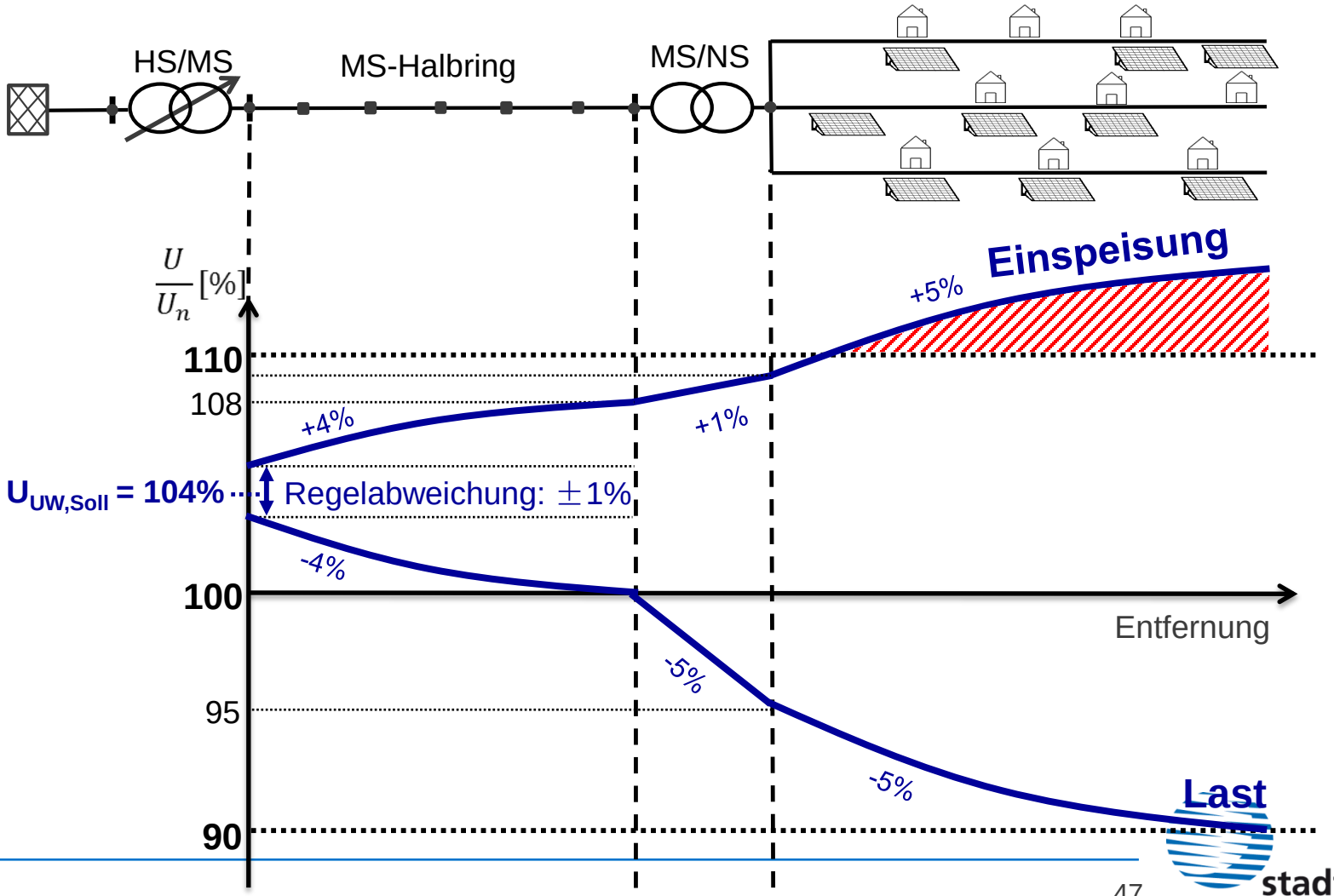
example



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voltage regulation with phase shifting

Blindleistungs-regelung

(kapazitiv oder induktiv)

Induktive Erzeugung:

→ U sinkt

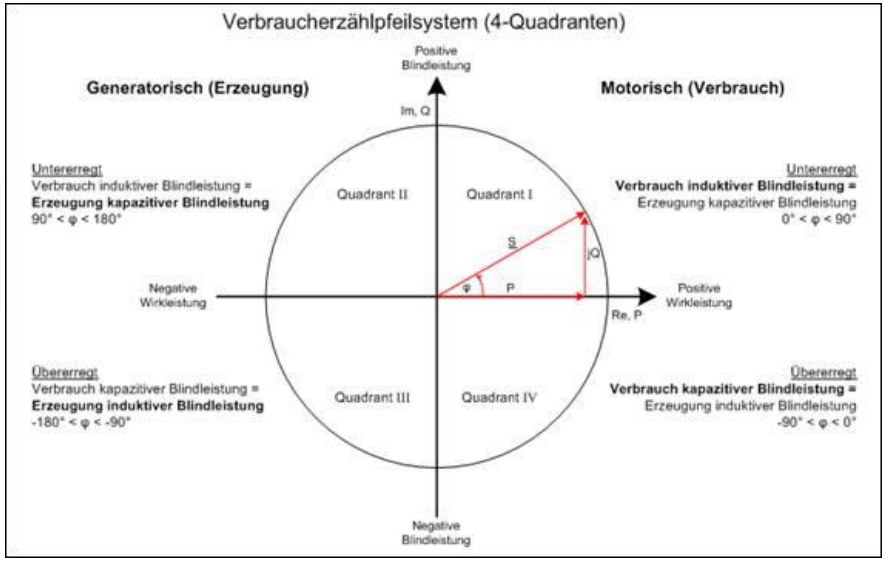
Kapazitive Erzeugung:

→ U steigt

Regelungskonzepte

→ Q (U)

→ cosφ (P)



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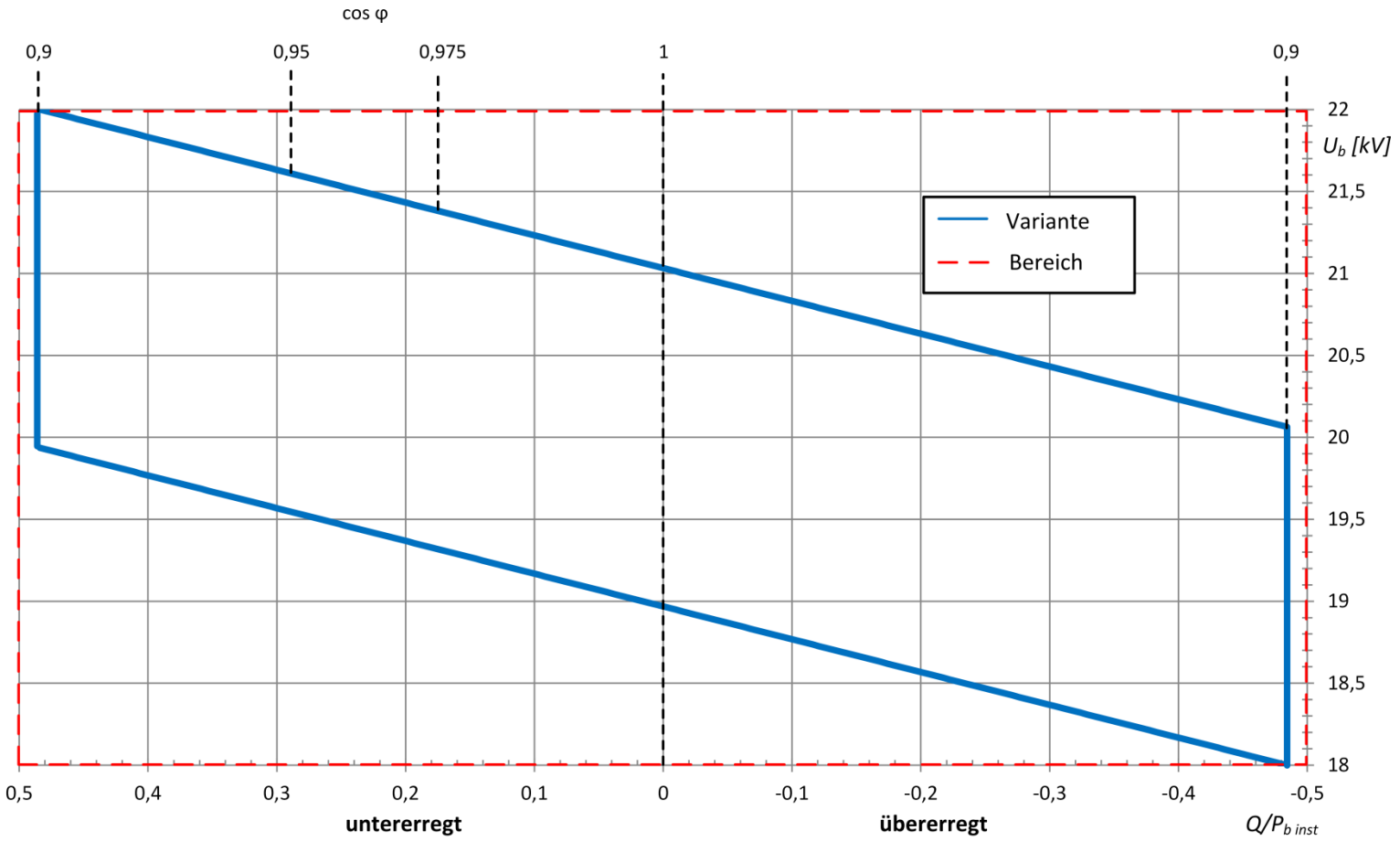
Phaseshifter



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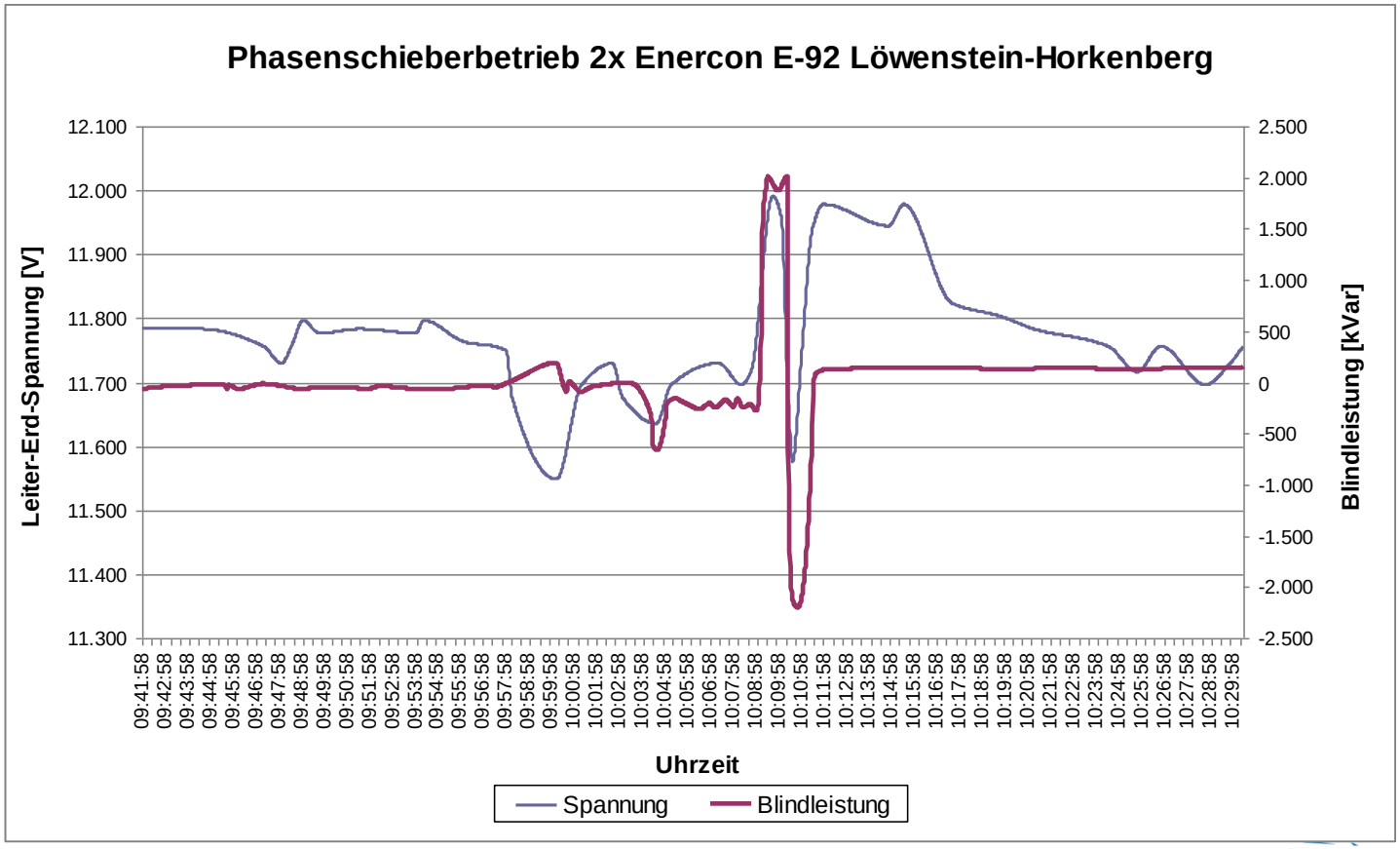
Phaseshifter in the grid

Bessere Ausnutzung der Systeme



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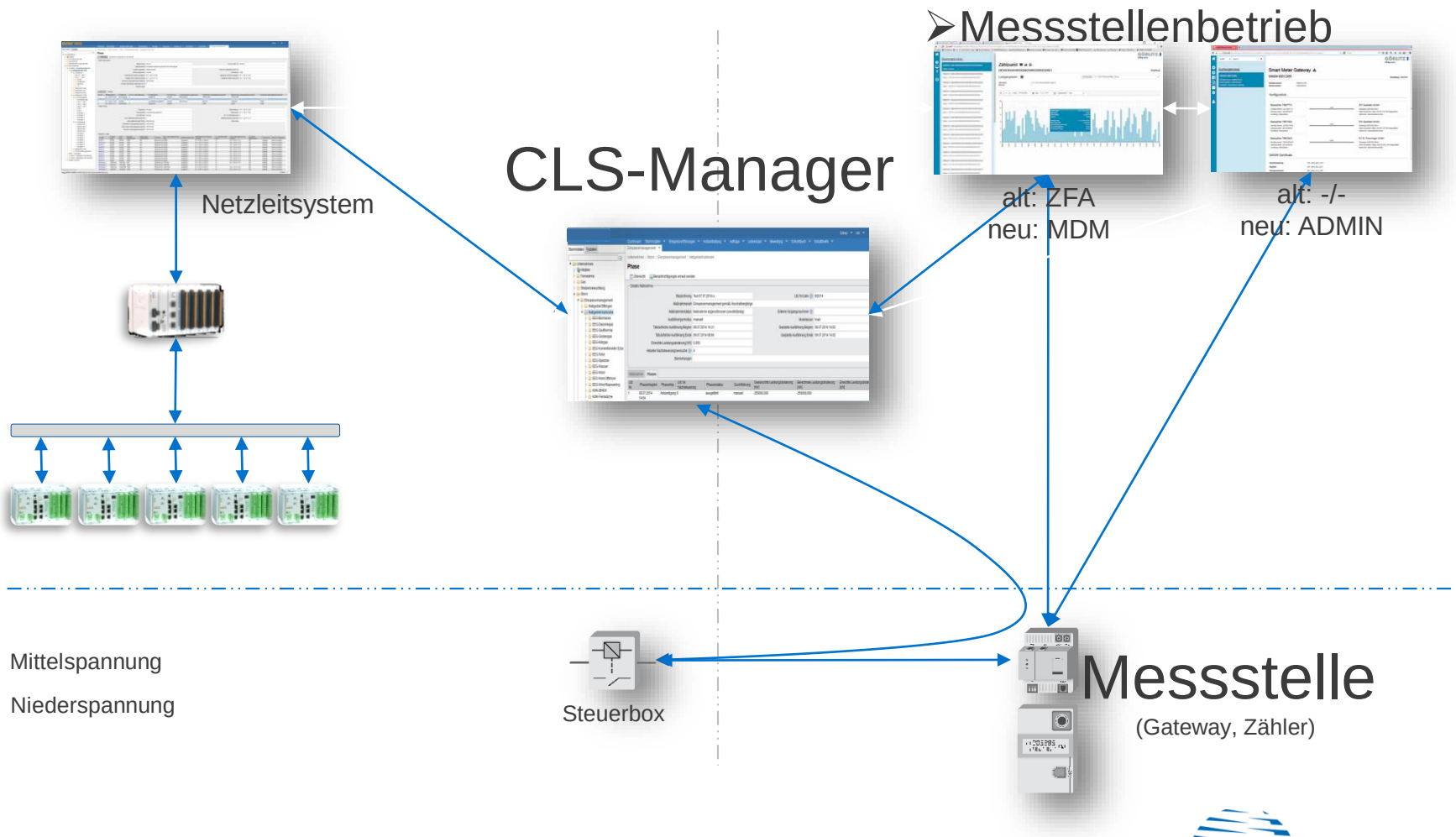
New Smart Meter and CLS Management (c/sells)



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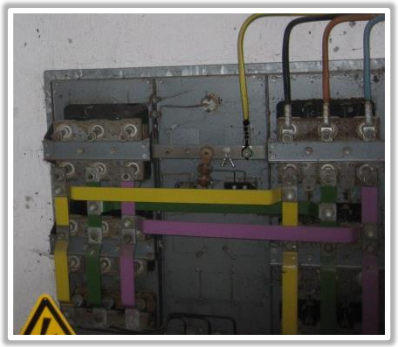
old and new power substation in germany

before

20 kV (MS) Schaltanlagen



new

Trafostationen

NS-Schaltanlagen

Kabelverteiler

old and new transformer substation in india

New power substations connected to the grid control with remote terminal unit

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switchgear inside

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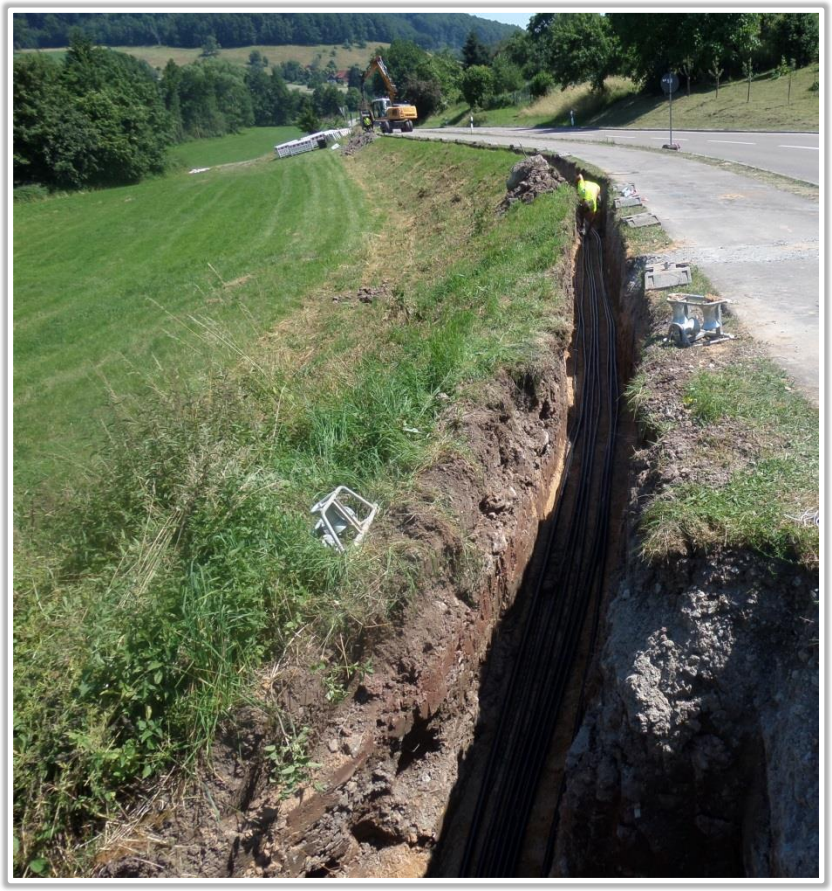
switchgear /cabel

most of the grids are in the underground/ no problems /thunderstorm



1/20 kV Kabelverlegung Gnadental

1/20 kV Kabelverlegung Neunkirchen

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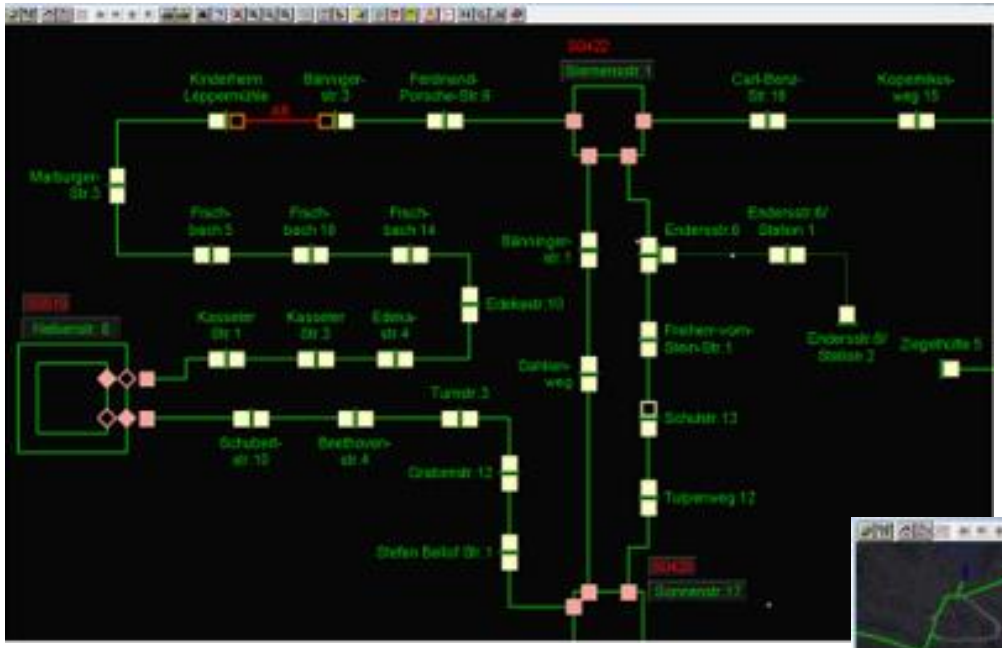
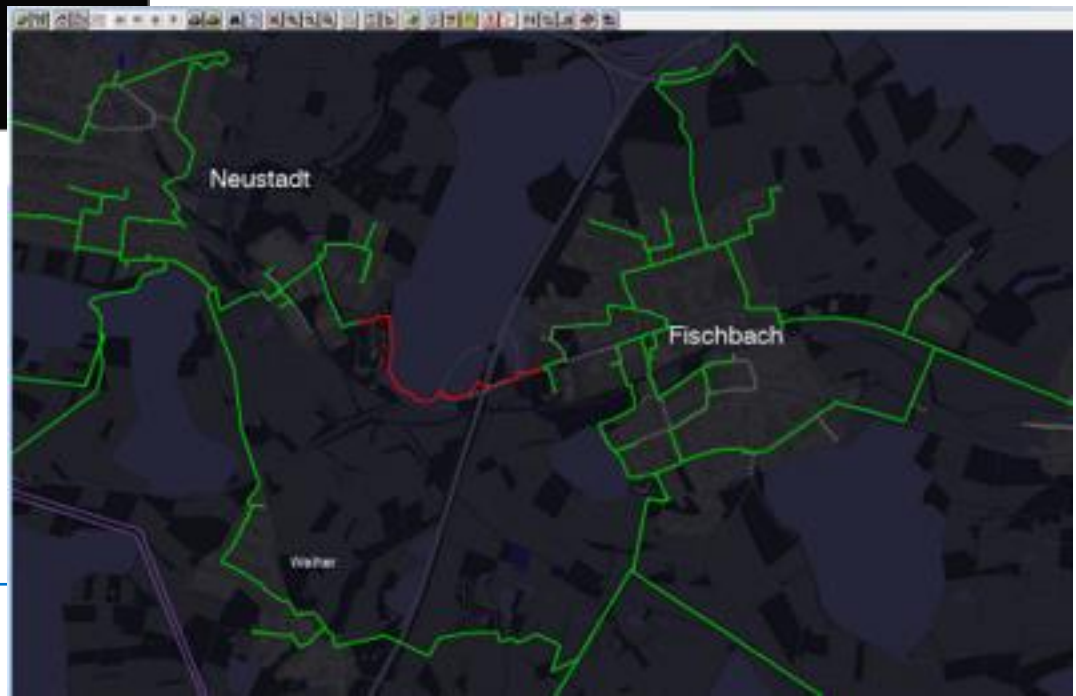
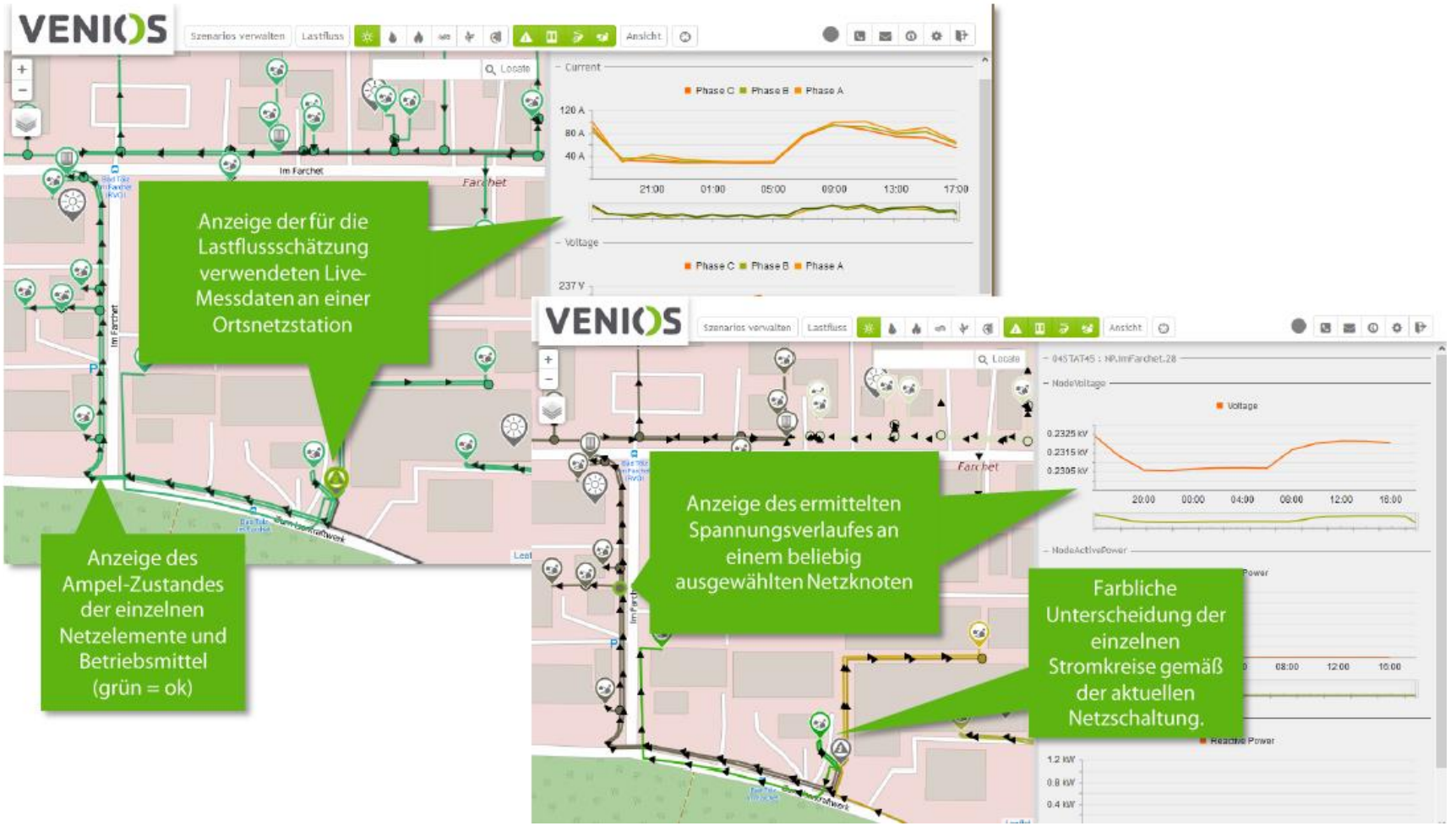
topology and GIS





Grid 0,4 kV low voltage grid



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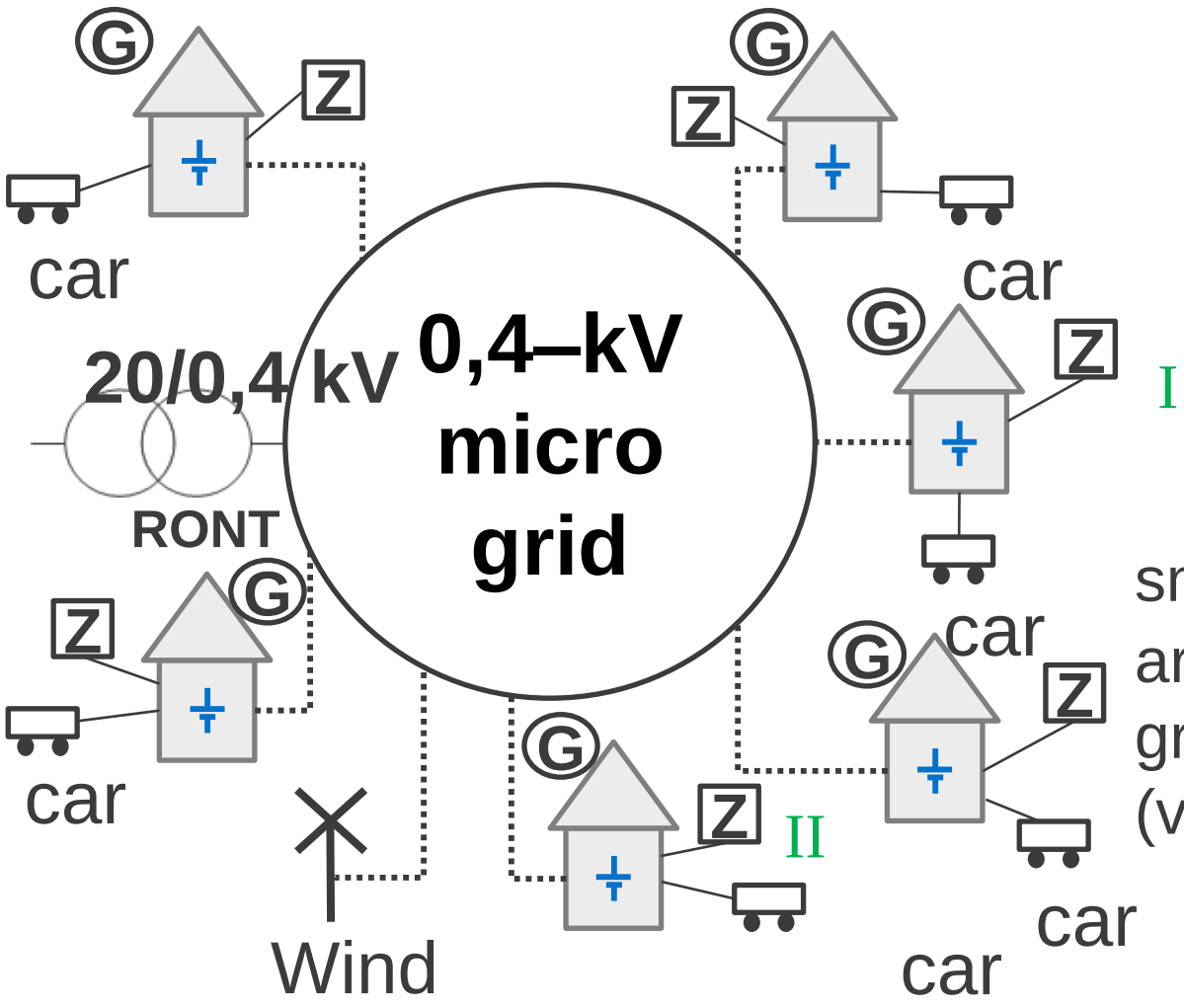
micro grids with smart meters and electrical cars



smart meter I u. II are connectet to the grid control (voltage, power)

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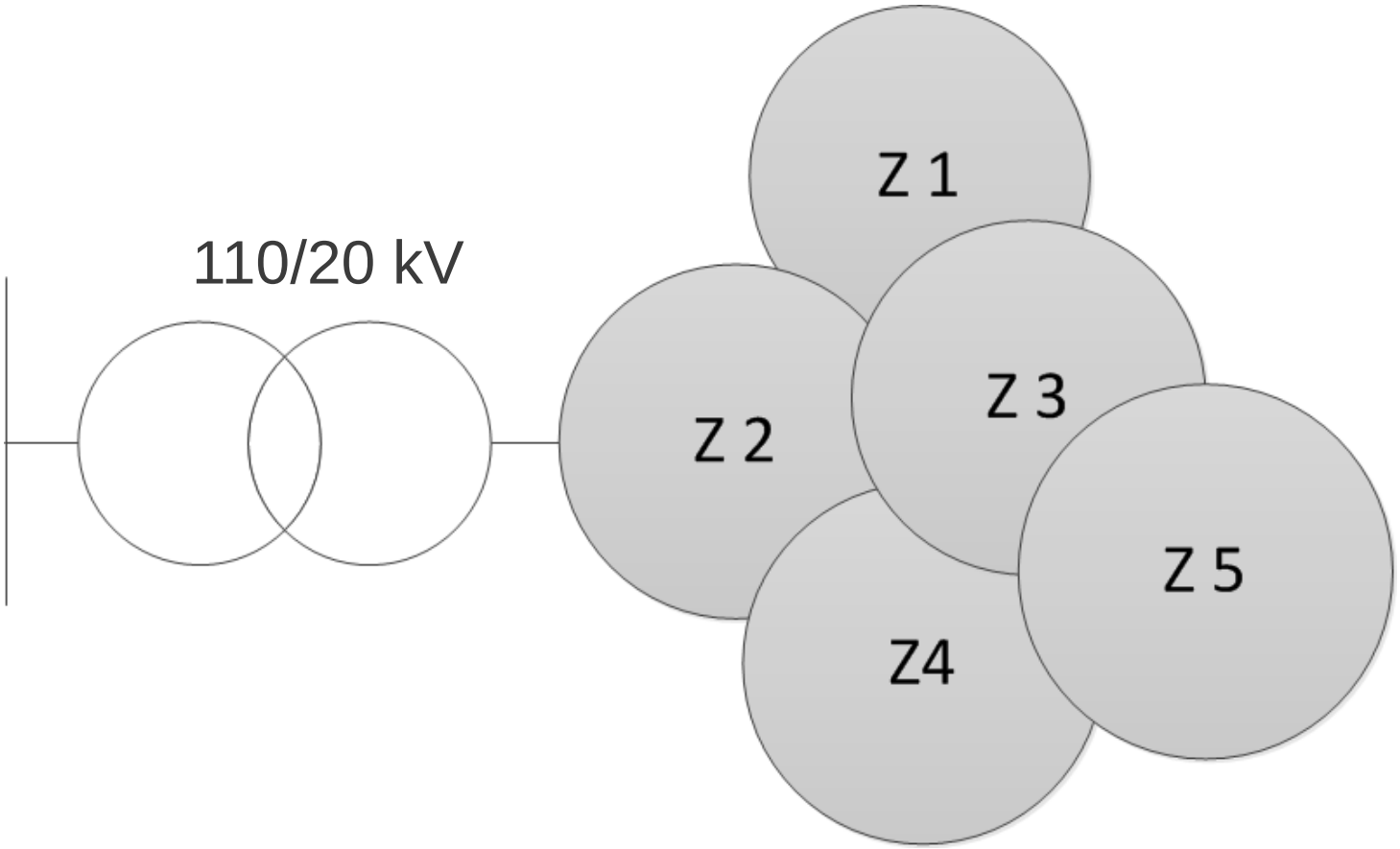
the future , many micro grids,a blackout for all is not possible



many micro gids in a village with schedule from the grid control

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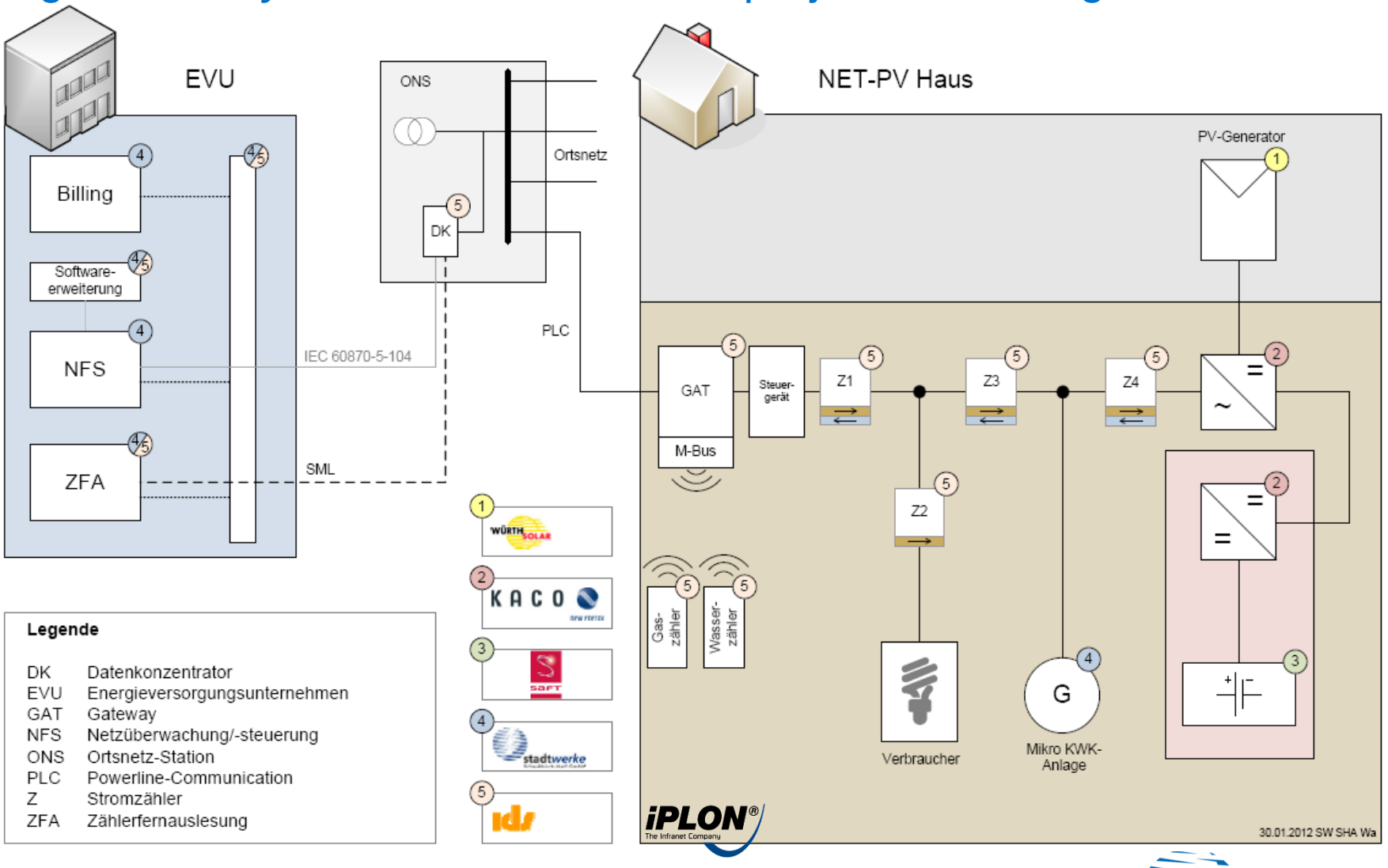
grid stability 4 -NET-PV Research project from the gouvernment



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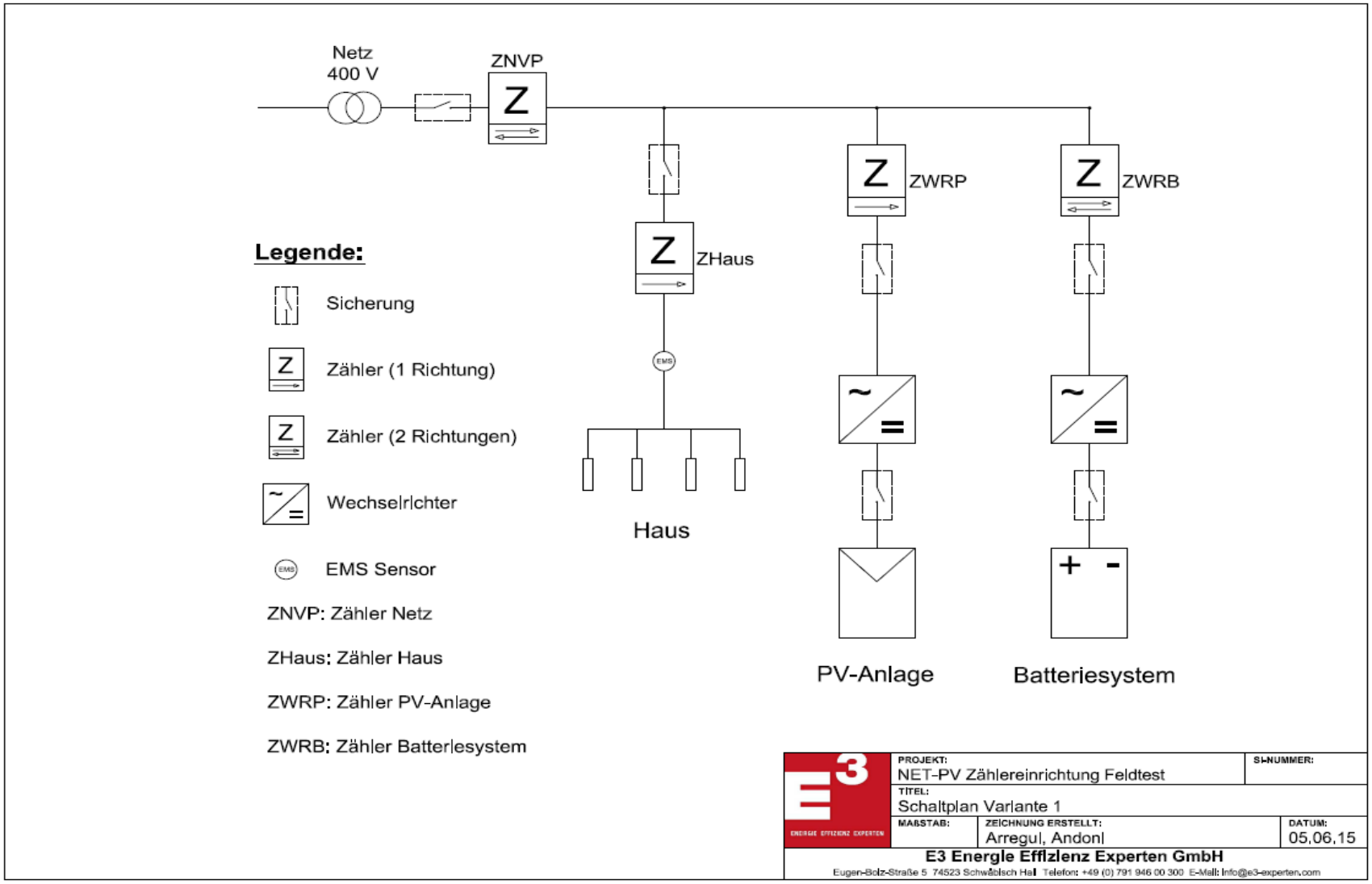
NET-PV research project gouvernment germany

- research projekt batteries in the low voltage grid
- Stadtwerke Schwäbisch Hall, E³(Würth Group), IDS, Saft Batteries, Fraunhofer ISE und Kaco; and in the house iPLON® The Infranet Company

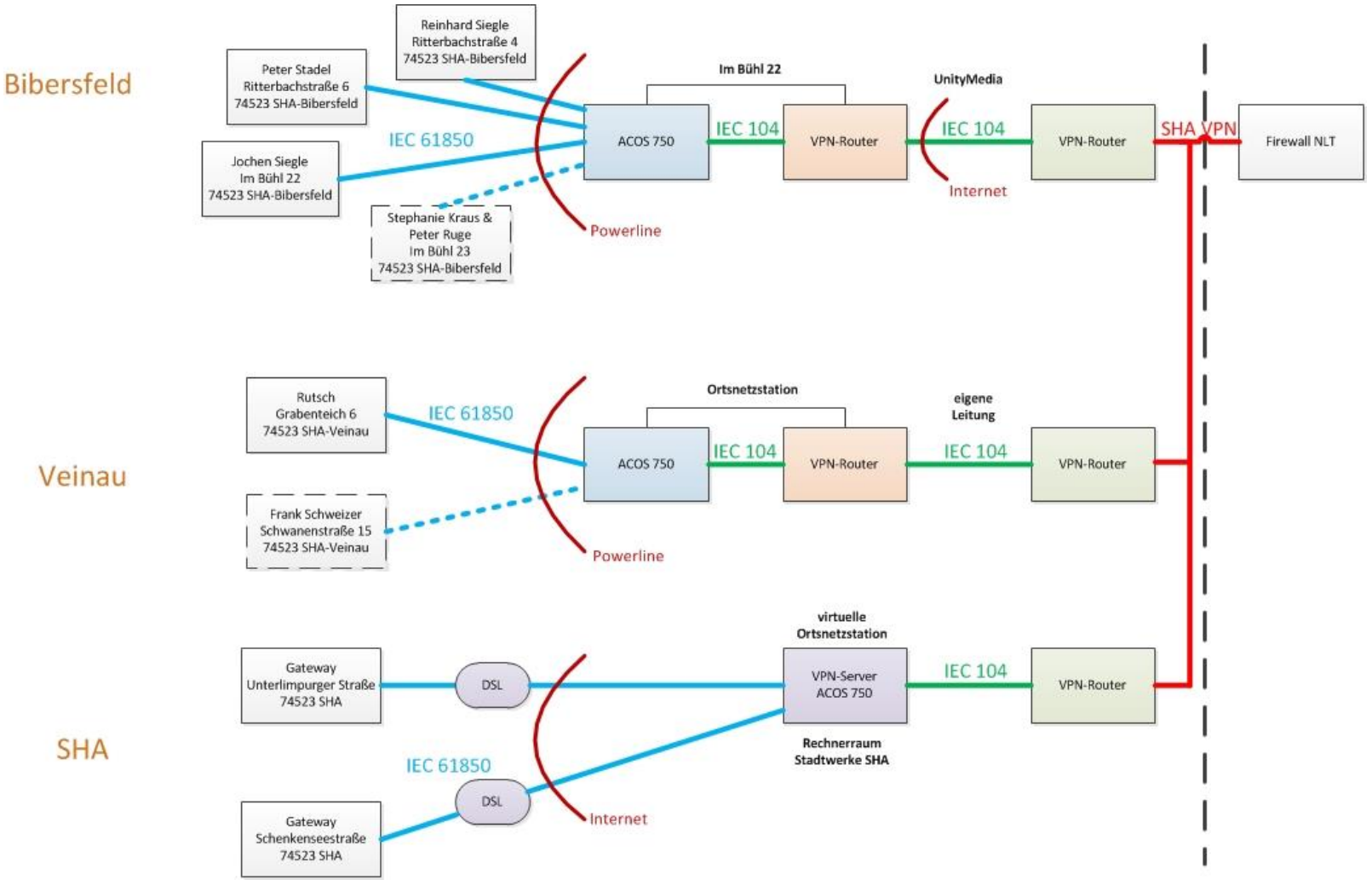
we called it –smart city (decentral energy storage)

- batterie
- virtal power management with the power plants
- connection with grid control
- PRL,SRL for grid stability
- we earn money

metering in the research project



smart meter and l-ion battries in the grid



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batterie works

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building with batteries

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we need smart meter in a smart city

- more information from the low voltage grid
- earn money , no uncalled investestment
- better fulfillment of demand
- new billing system

new players;new process flow; cell manager

→benchmarking power plants
→enginnering grids
→grid automation
→house automation
→……..

you need companys with brilliant ideas

smart grid – the future for grids and for a better world

- phase shifter
- adjustable transformers
- batteries
- integration electric cars
- fotovoltaik power plants
- smart meters
- windparks

- grids as „ living“ cells
- we need a cell manager
- we all need companys like iPLON® The Infranet Company

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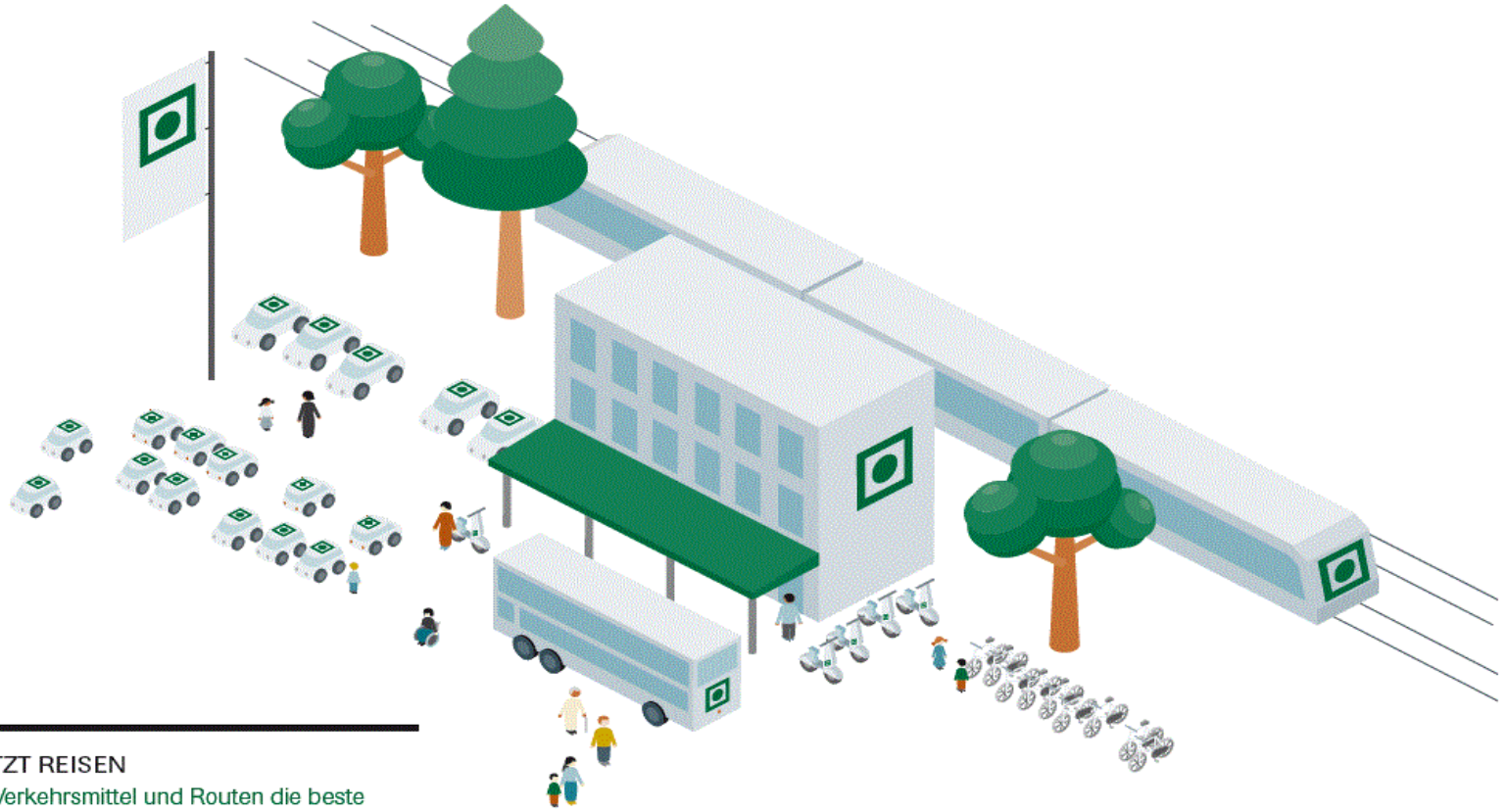
e mobility in the year 2030



VERNETZT REISEN

Welche Verkehrsmittel und Routen die beste Wahl darstellen, kann man im Internet abrufen. Aufeinander abgestimmte Mobilitätsangebote ermöglichen ein schnelles und bequemes Vorankommen.

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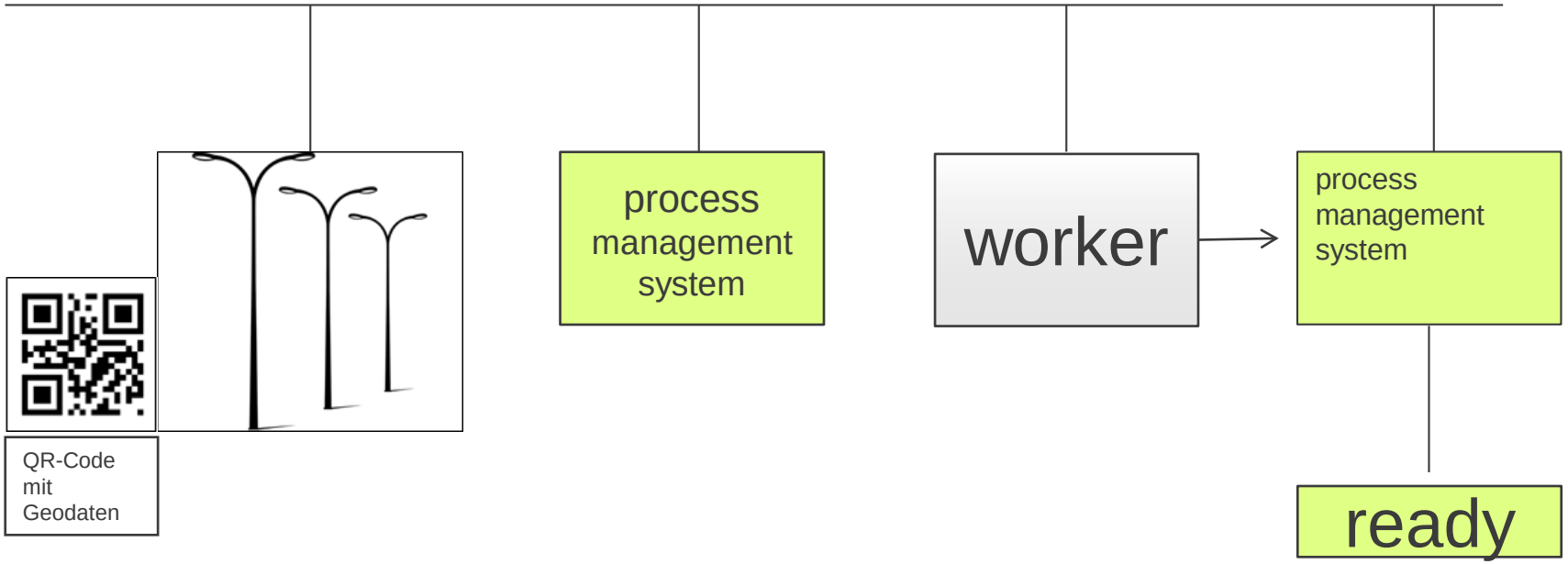
disturbance road lighting via app for a smarter city



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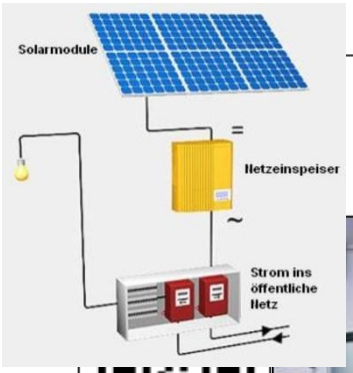
disturbance via app for smarter buildings



QR-Code an Heizungsanlage angebracht

process managemen system

Worker

process managemen system

ready

bill

disturbance
what kind of disturbance

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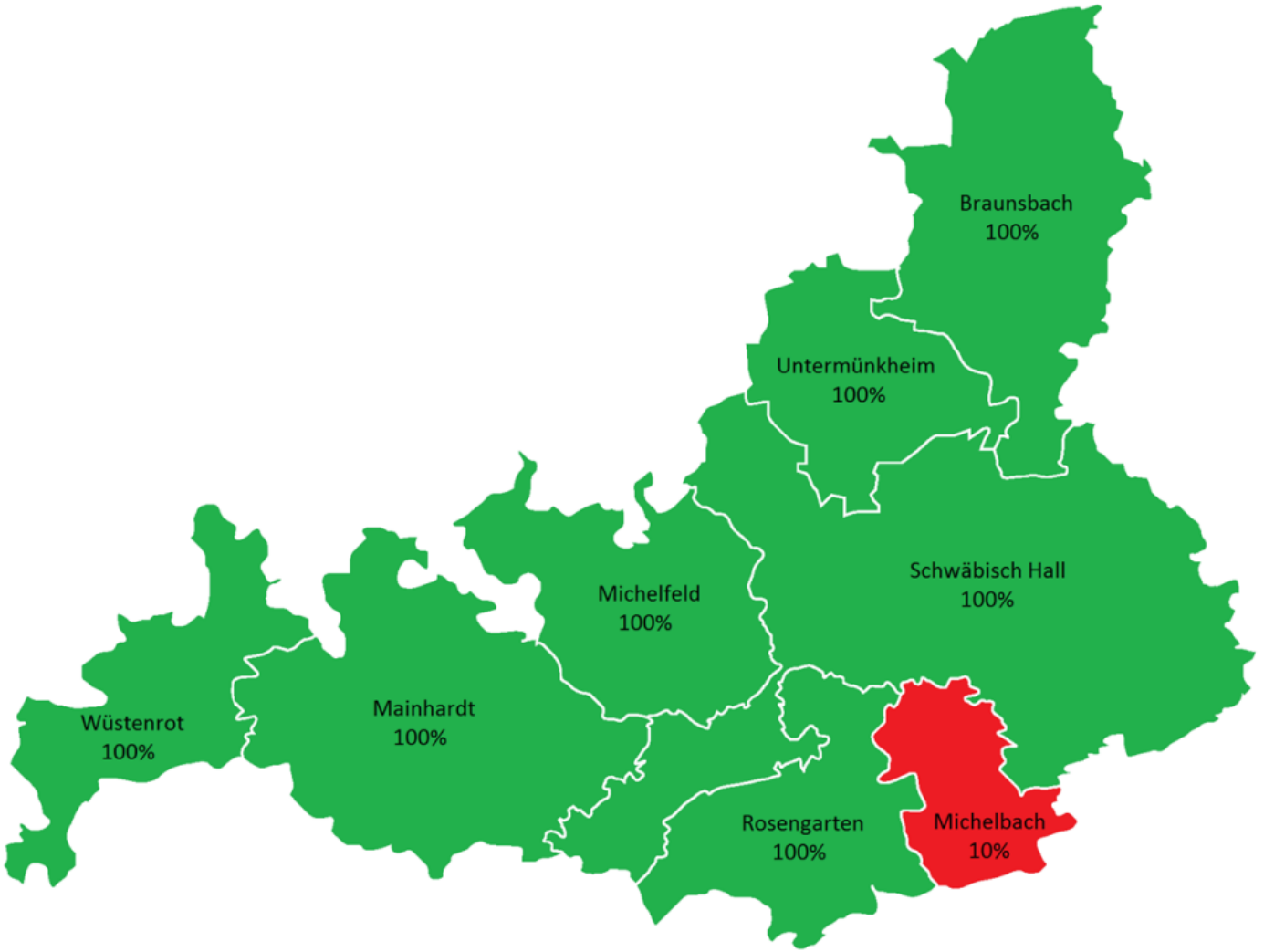
grid overview via app / information about the grid stability in smart cities



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TOP 6: training and simulation

- dynamik simulator electrical grids
- short circuit ,earth fault
- we exercice all situations

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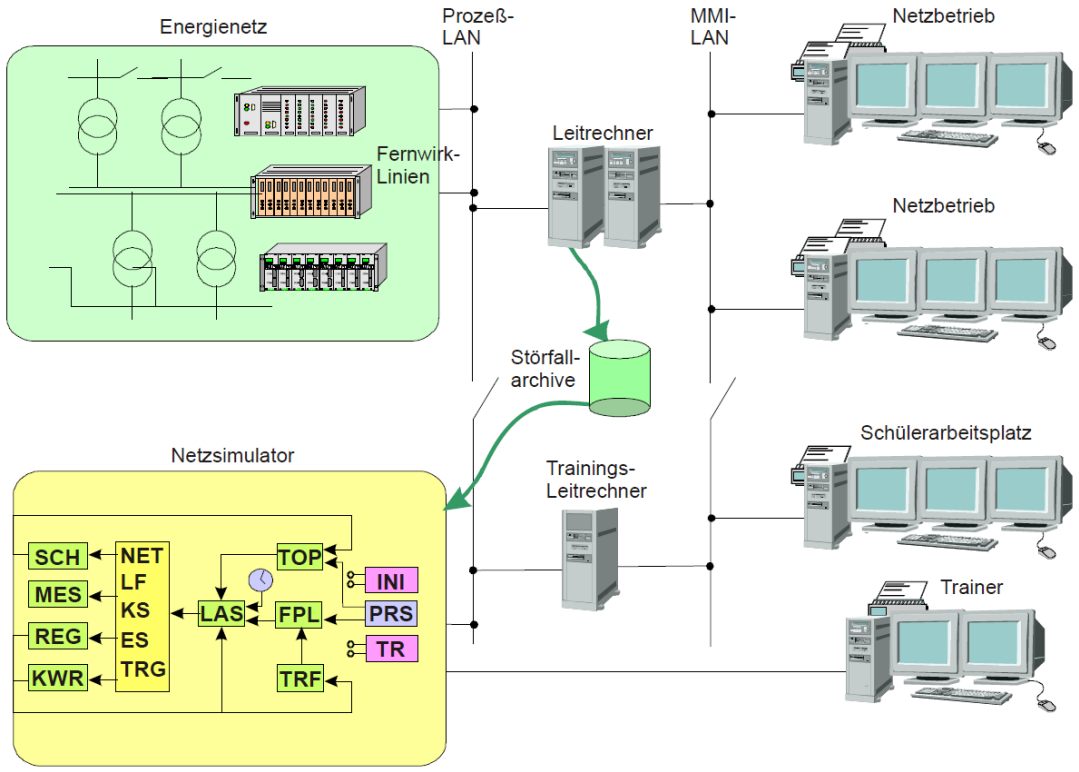
structure trainingssystem

- neutral point connection
- phase shifter
- inrusch currents
- blackout



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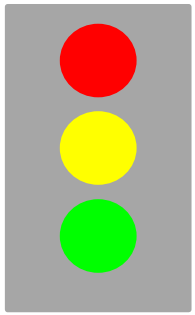
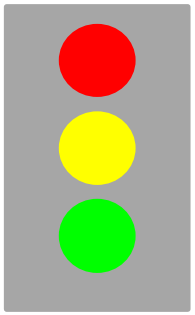
grid stability in the high voltage grid (DSO)

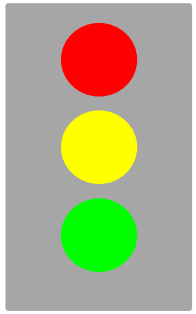
amprion

TenneT





TRANSNETBW



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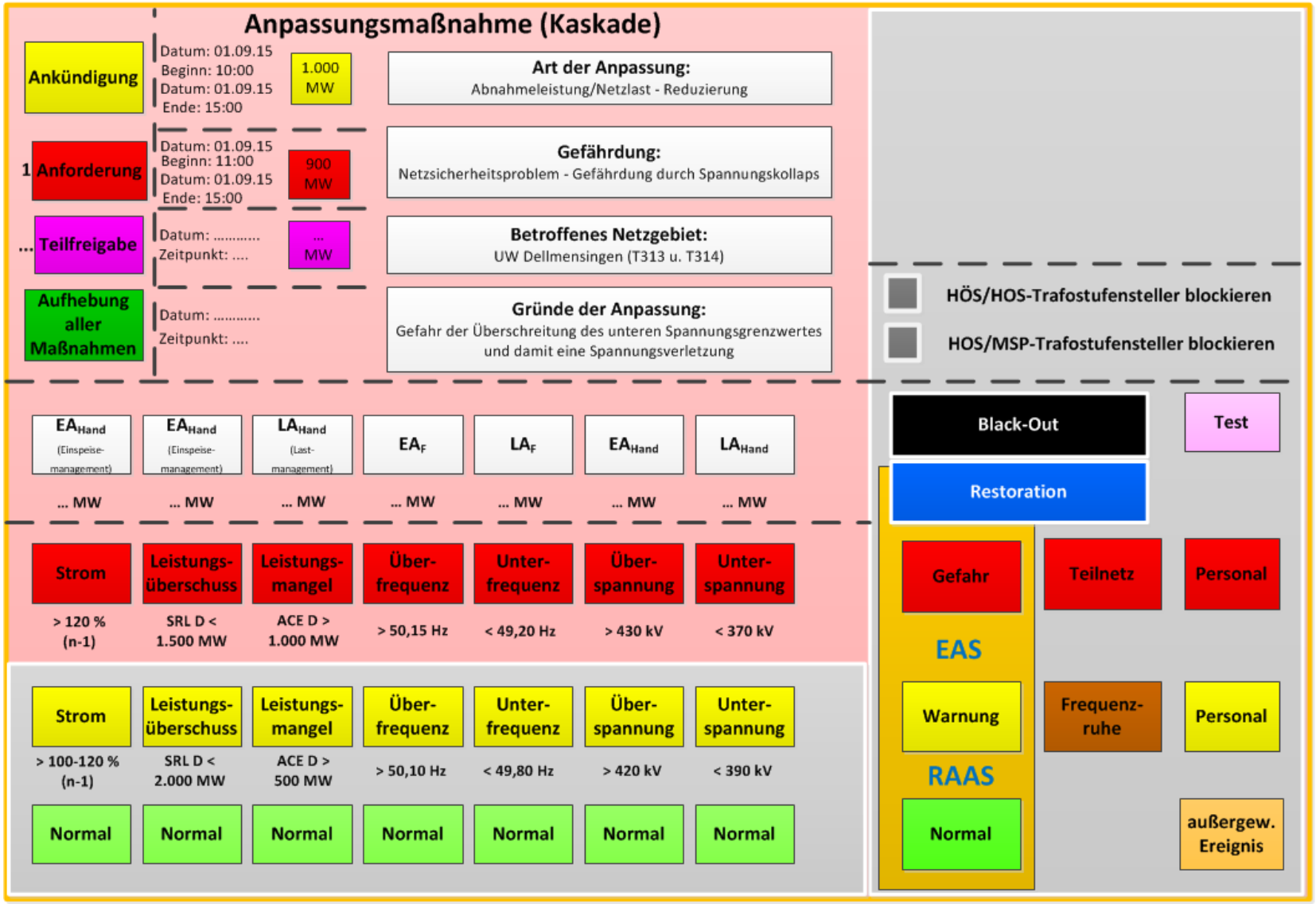
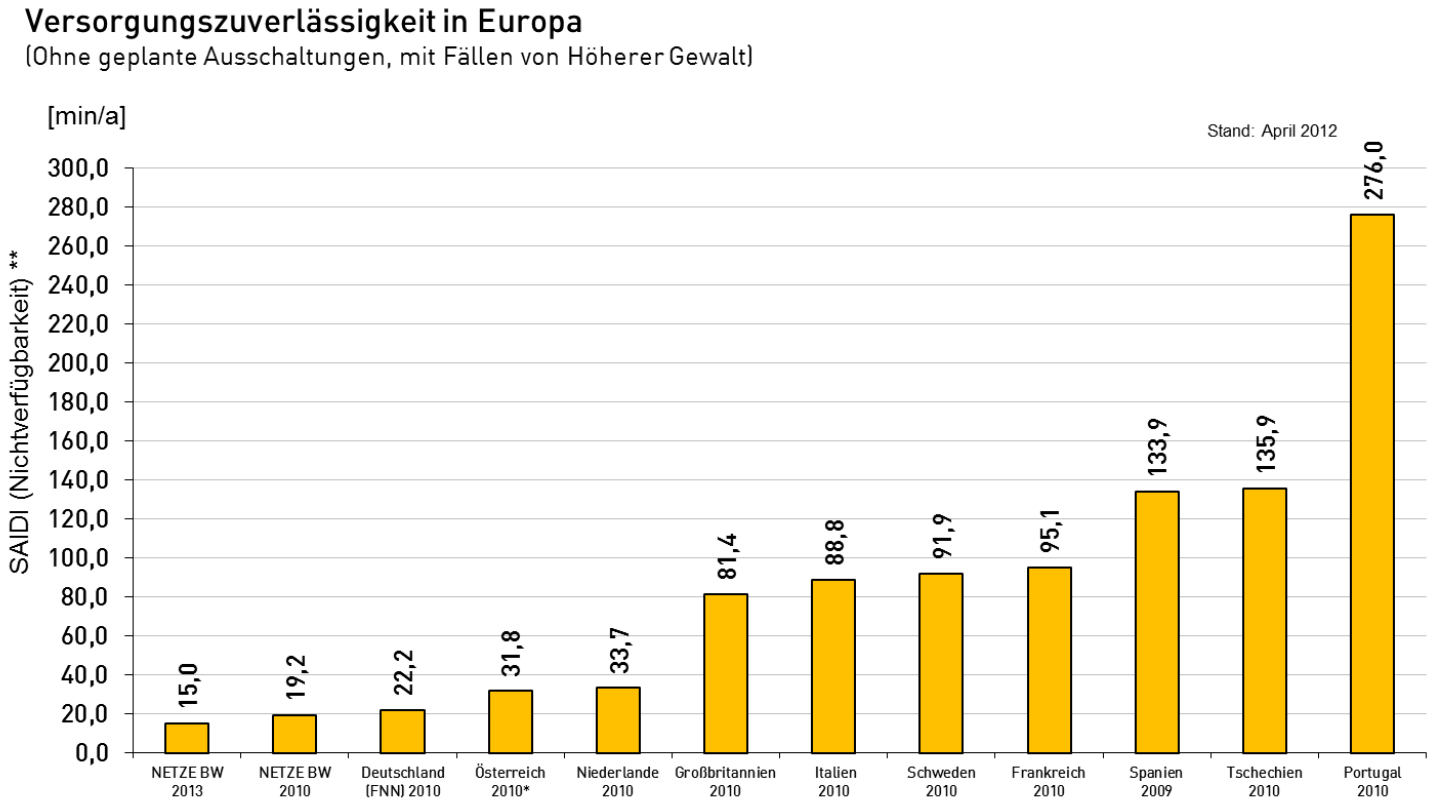
alarmsystem cascade from DSO first level to DSO second level



the grid in germany is the best electrical grid in europe



* ohne Niederspannung
** für Endkunden in der Niederspannung
Quellen: 5th CEER Benchmarking Report on the Quality of Electricity Supply 2011, Council of European Energy Regulators (CEER);
Störungs- und Verfügbarkeitsstatistik 2010, Forum Netztechnik/Netzbetrieb im VDE (FNN), Berlin

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remember– why is the business grid control so difficult

- a lot of rules (we say the energy bibel)
- the weather is digital (monday 15 degree minus,thuesday 10 degree plus)
- the forecast is difficult
- the grid system is chanching
- the process is difficult
- many systems

  GRID SYSTEM

  MANAGEMENET SYSTEM (Alarm operating)

  CAMERA SYSTEM (stolen pv power plants or problems car parking)

  METERING SYSTEM

  FORECAST SYSTEM

  TRADING TELEPHONE

one example (we have more then 1000 process in a control room with more then 500.000 steps)

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LSM

LeitstellenSicherheitsManagementsystem

example for shift on or off a 20 KV switch

Prozesstyp	Kernprozess
Mandant	Stadtwerke Schwäbisch Hall GmbH
Bereich	Strom
Teilbereich	Schalthandlungen
Prozessverantwortlicher	Daniel Koch
Prozessname	MS Schaltung geplant
System	Netzleitsystem IDS
Bild	
Dokumentation	

Kurzbeschreibung:
Der nachfolgende Ablauf zeigt die Vorgehensweise bei der Vorbereitung und Durchführung von geplanten Schaltungen im Mittelspannungsbereich

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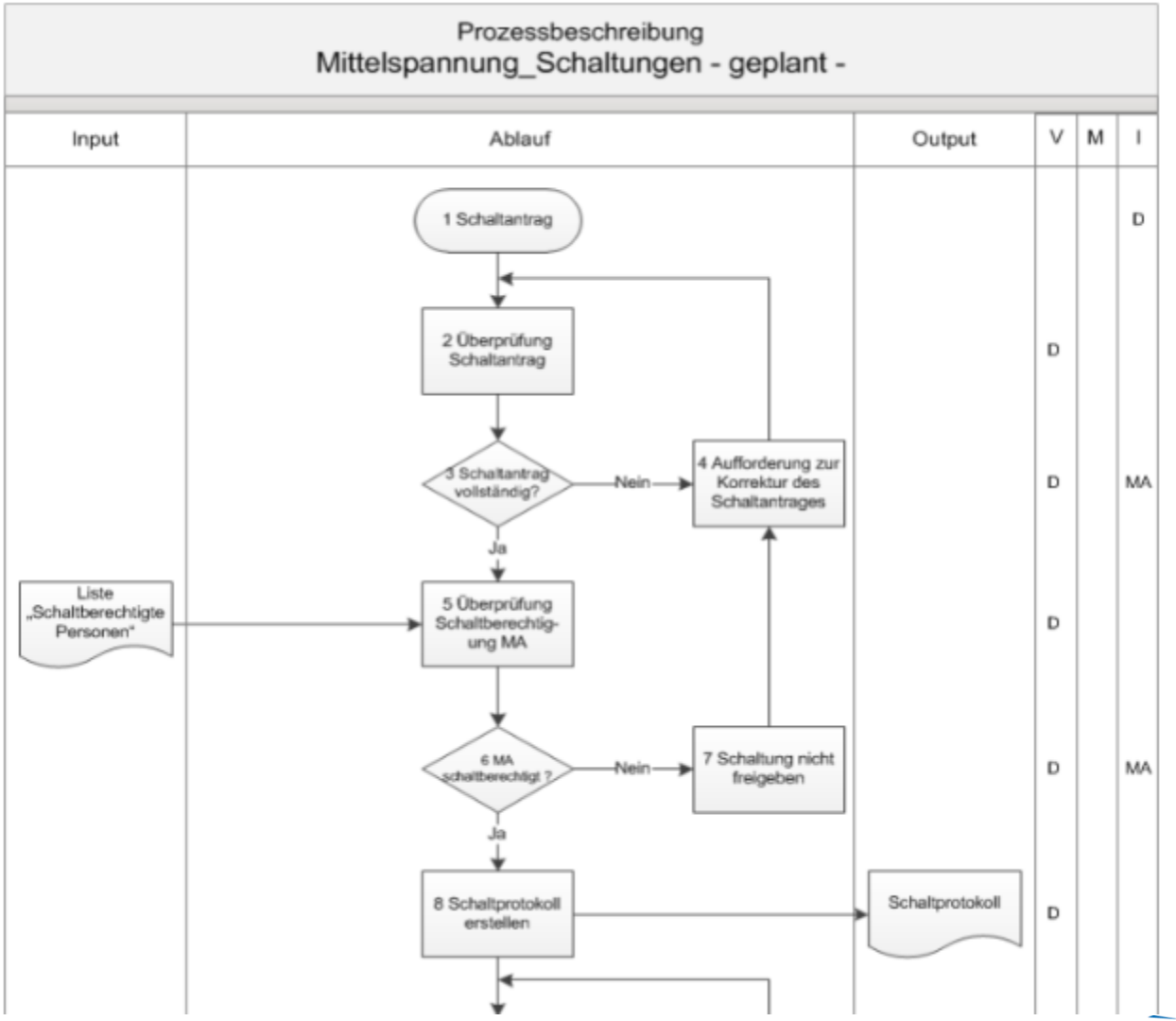
the dispatcher must plan a connecting in grids (38 steps)



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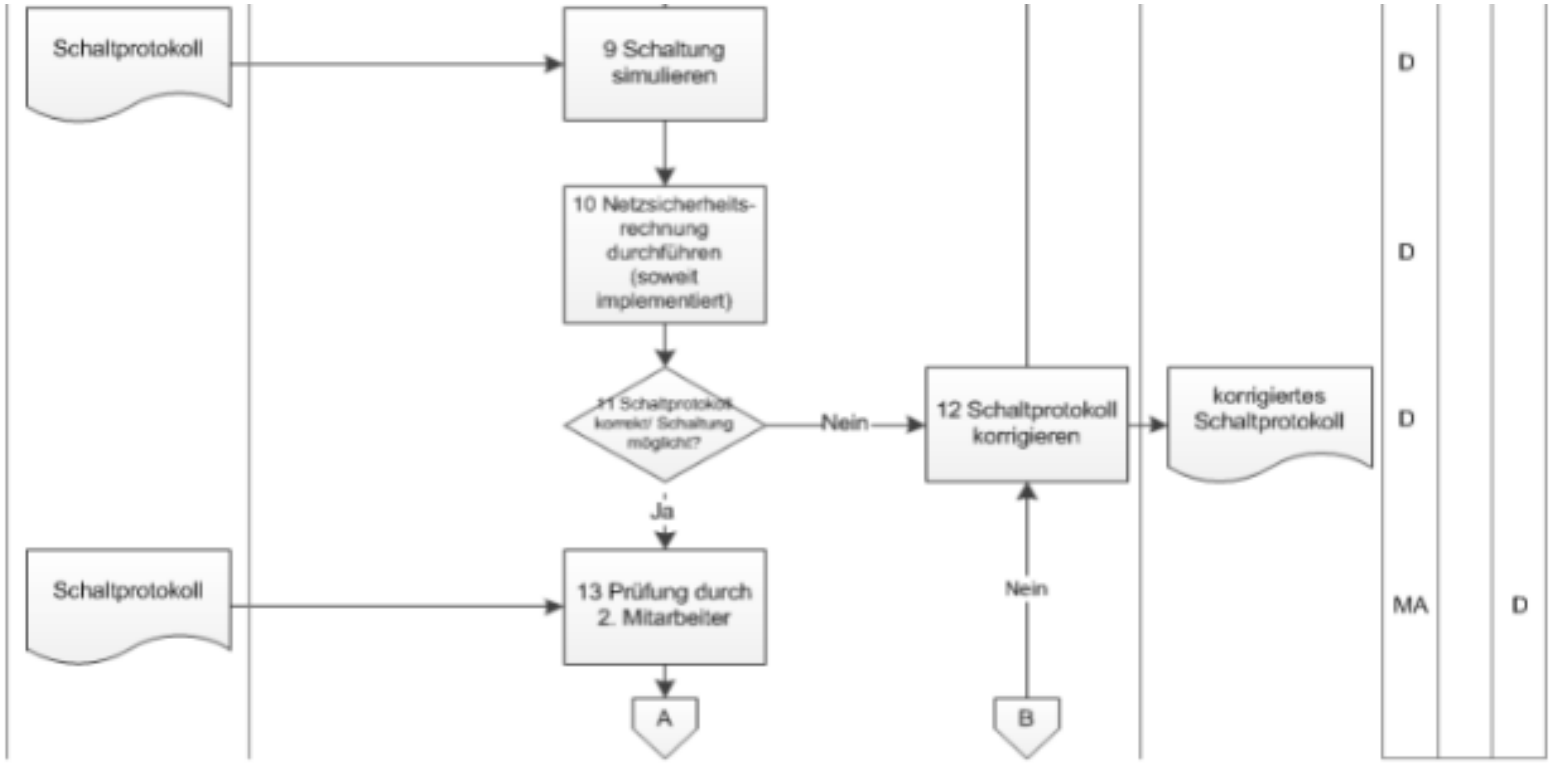
he must simulate all



Dateiname: MS Schaltung geplant.docx			Version:2.0
erstellt am: 31.10.2013	geändert am: 23.07.2015	geprüft am: 22.05.2014	freigegeben am: 22.05.2014
Name: Caschetto, Isabella	Name: Engel, Natalie	Name: Koch, Daniel	Name: Breuning, Peter

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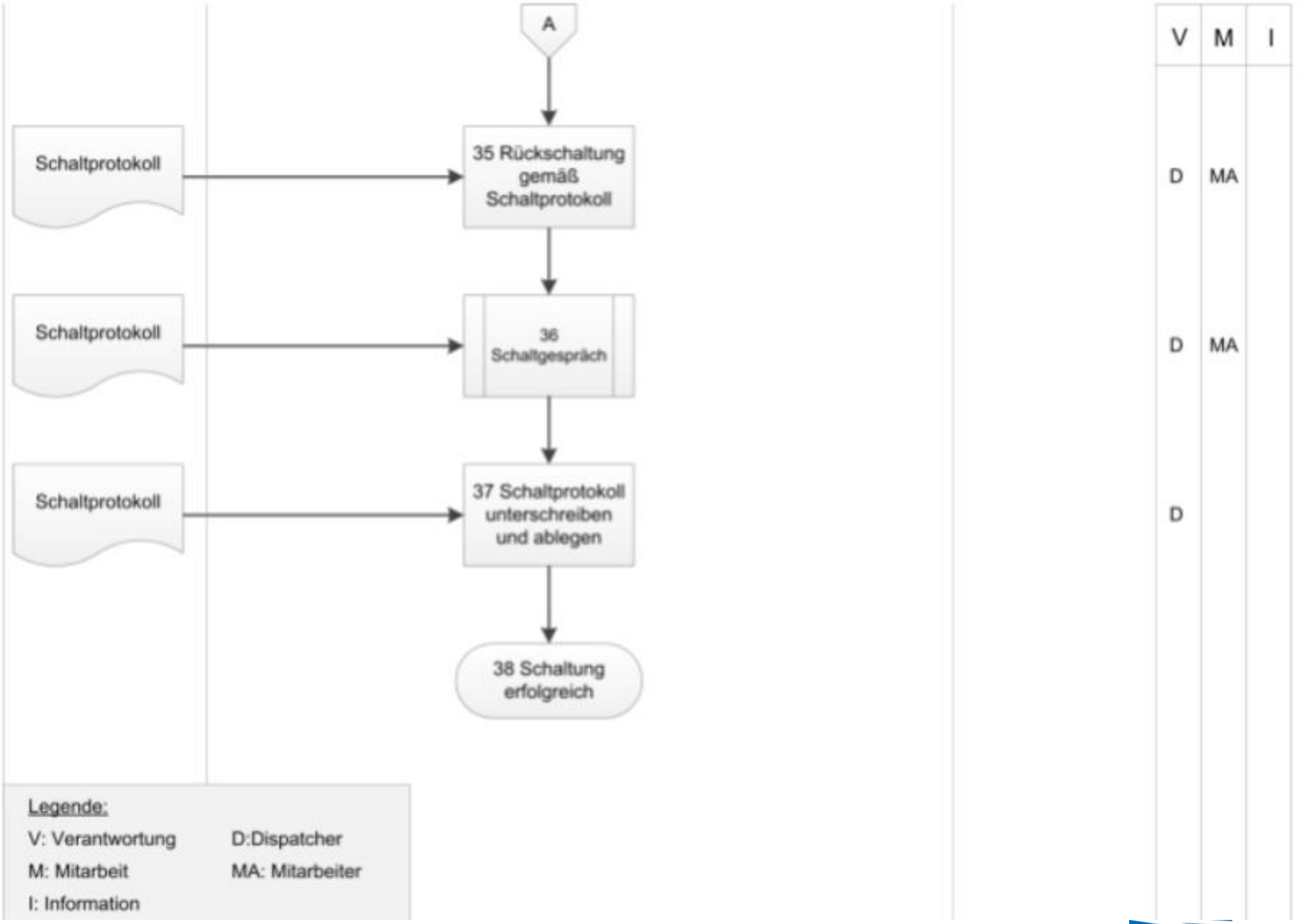
all the process what we do, we need for the construction 5 years !!



hard aims /no mistace

PROZESSZIELE:						
Nr.	Kenngröße	Ziel-wert	Mess-größe	Mess-frequenz	Quelle	Verant-wortlich
01	Fehlerquote Schaltungen: Durch fehlerhafte Ausführung ausgelöste Fehlschaltungen zu Gesamtanzahl der Schaltungen $\frac{n_{Fehlschaltungen,a}}{n_{Schaltungen,a}} * 100\%$	0	%	Jährlich	IDS – PMS Störberichte	Prozessver-antwortlicher

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example- a customer phones – no power

Prozesstyp	Kernprozess
Mandant	Stadtwerke Schwäbisch Hall GmbH
Bereich	Strom
Teilbereich	Störungsbearbeitung
Prozessverantwortlicher	Daniel Koch
Prozessname	Störungsbearbeiten Kundenanruf
System	Telefon
Bild	
Dokumentation	Prozess Management System PMS

Kurzbeschreibung:

Der nachfolgende Ablauf beschreibt die Vorgehensweise bei der Störungsbearbeitung im Bereich Strom im Falle eines Kundenanrufs.

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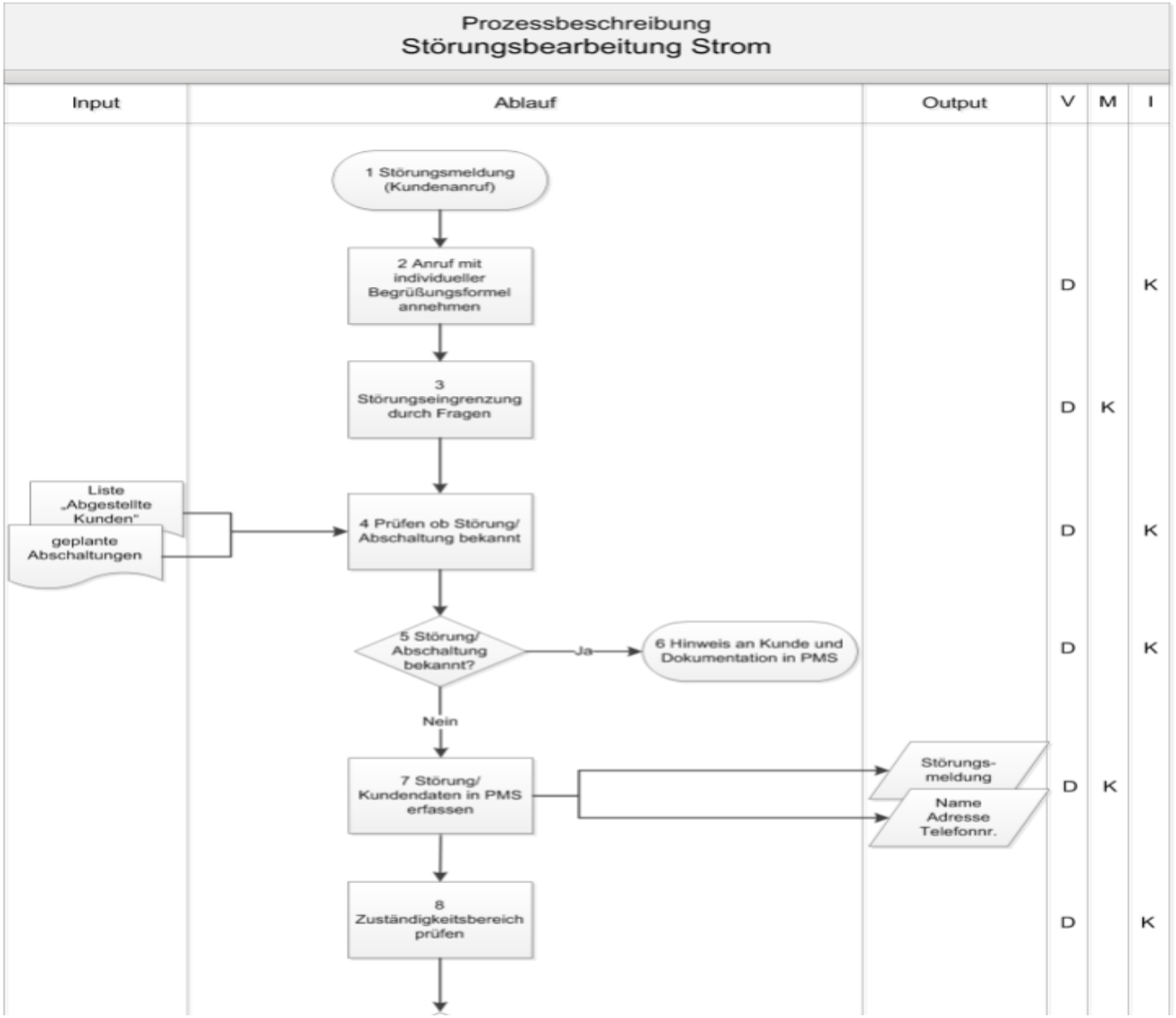
he must learn all process, he must use all systems



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are you teamplayer ? **YES !!!**

the exit from nuclear and fossil-fuel energy is running,

smart cities are comming

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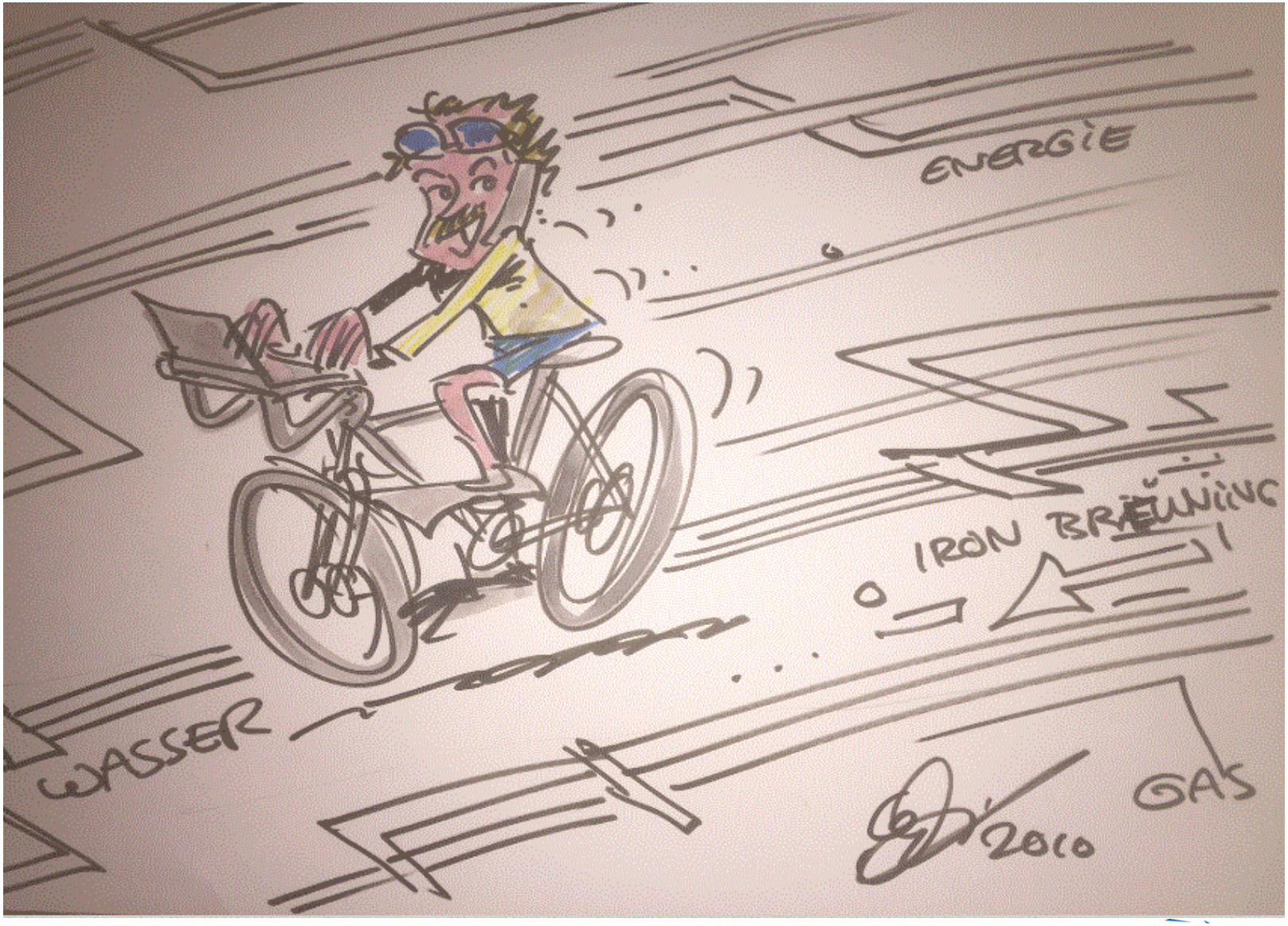

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Thank you for your attention!

More information on *www.stadtwerke-hall.de*.

Contact:

Peter Breuning
AL Netzleittechnik

Tel.: 0791 401-300
Fax: -
breuning@stadtwerke-hall.de

Stadtwerke Gandhigram

"Be the change you want to see in the world."

- Mahatma Gandhi

Sreenath C

iPLON India Pvt Ltd.

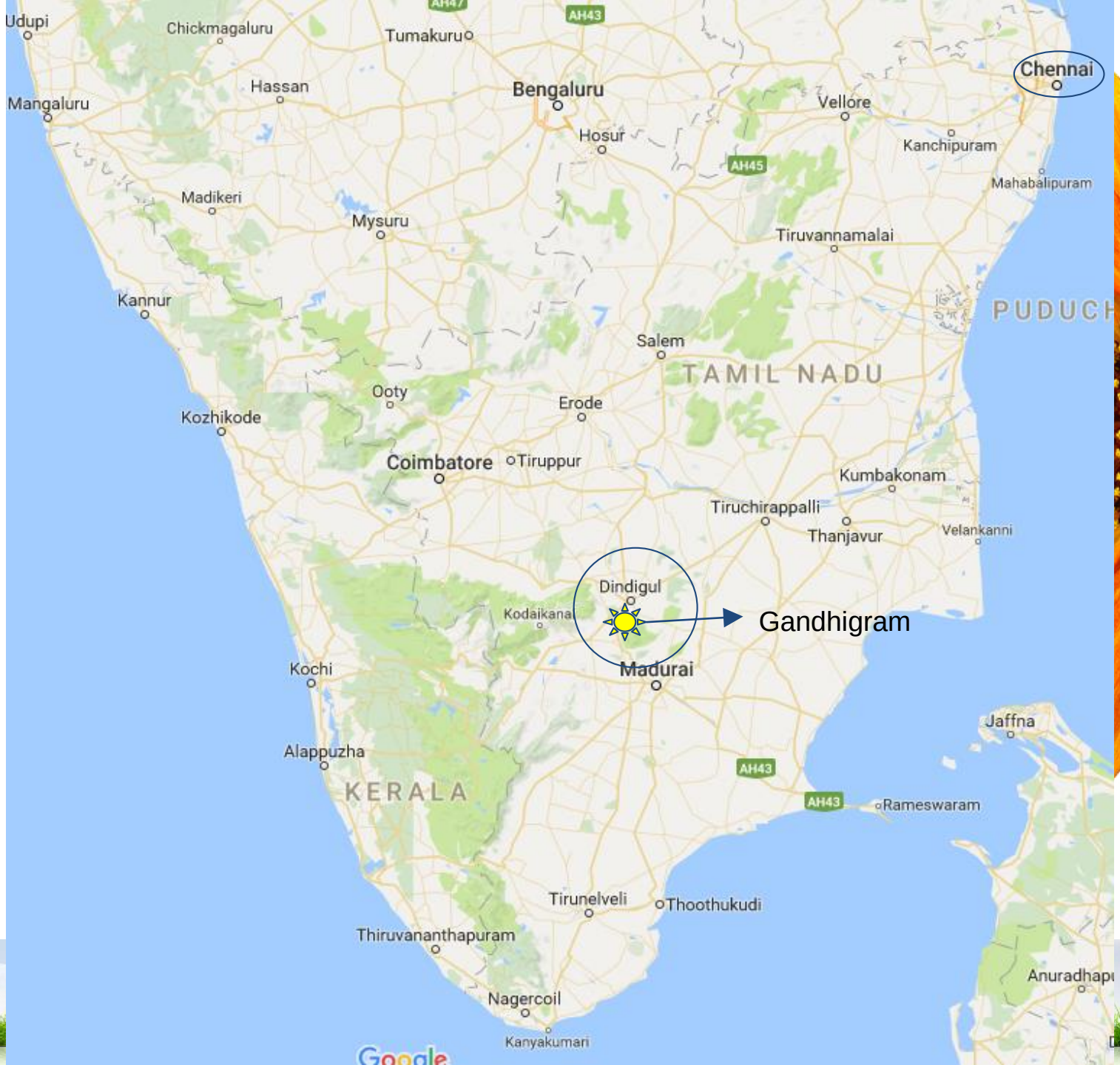
iPLON® The Infranet Company

Agenda

- Reaching Gandhigram
- Gandhigram Rural Institute
- Rural Energy center

- Stadtwerke Gandhigram
    a. Renewable Energy/Energy Efficiency
    b. Water Management
    c. Waste Management
    d. E-Mobility
    e. Efficient Cooling Systems

- Why Stadtwerke Gandhigram
- Why Gandhigram
- How do we achieve together
- Students from Gandhigram: Working at iPLON
- MOU | Commitment for Stadtwerke Gandhigram
- On-going tasks
- More Pictures

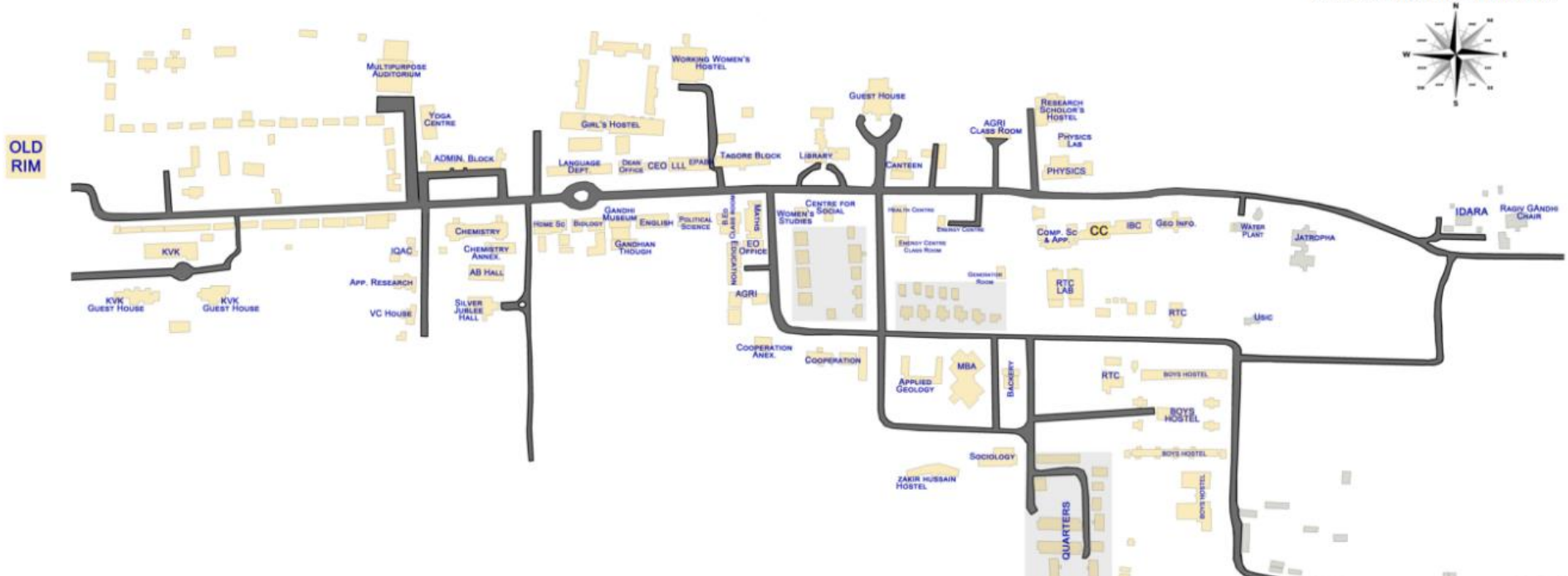

Udupi
Chickmagaluru
Tumakuru
AH47
AH43
Chennai
Hassan
Bengaluru
Mangaluru
Vellore
Hosur
Kanchipuram
AH45
Mahabalipuram
Madikeri
Mysuru
Tiruvannamalai
Kannur
PUDUCH
Salem
TAMIL NADU
Ooty
Erode
Kozhikode
Coimbatore
Tiruppur
Kumbakonam
Tiruchirappalli
Thanjavur
Velankanni
Dindigul
Kodaikanal
Gandhigram
Kochi
Madurai
Jaffna
Alappuzha
KERALA
AH43
AH43
Rameswaram
Tirunelveli
Thoothukudi
Thiruvananthapuram
Anuradhapu
Nagercoil
Kanyakumari
Google

Gandhigram Rural Institute

Mission: Providing knowledge support to rural sector to usher in a self-reliant, self-sufficient and self-governed society

- The place fondly named ‘Gandhigram’ was inaugurated by Mahatma Gandhi on 7th October 1947
- Devoted followers of Mahatma Gandhi founded the Gandhigram Rural Institute in 1956
- Built on 207 acres of land, mostly donated by the villagers with the hope that their children will get education and employment
- 3500 students today, 85% from the Rural background
- University focussed on rural higher education programmes
- Funded by the Ministry of Human Resource Development, Government of India

On mouse click Zoom in the Map



Rural Energy Center

To establish a model "energy village" with renewable energy & energy conservation technologies

- Set-up in 1998
- Runs a 2-year M.Tech RE course
- Renewable Energy Planning for Villages
- KW scale rooftop off-grid plants
- Energy Auditing
- Renewable Energy Lab

- 20 students in each year
- 7 of them working at iPLON


RURAL ENERGY CENTRE

Stadtwerke Gandhigram

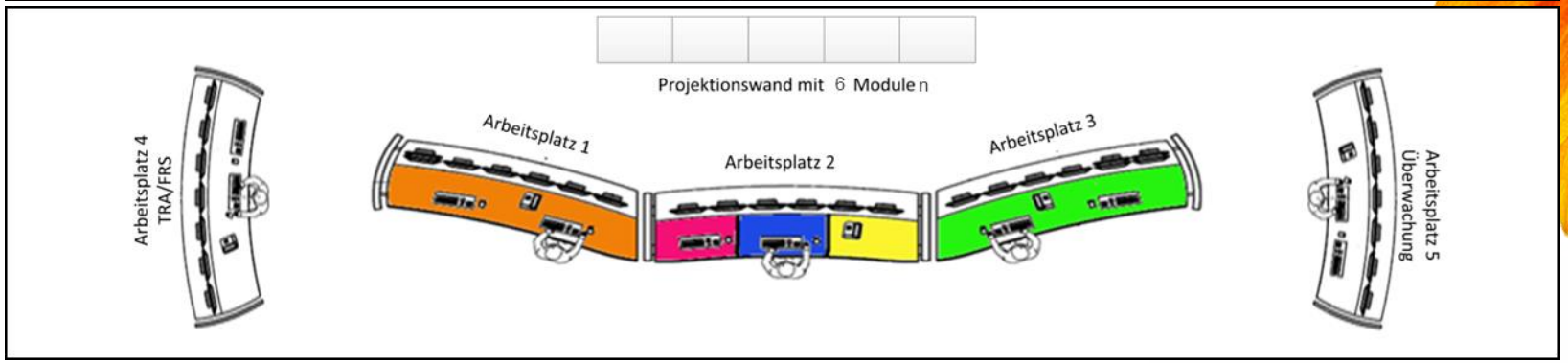
5 Focus areas:

- Renewable Energy / Energy Efficiency
- Water Management
- Waste Management
- E-Mobility
- Efficient Cooling Systems

"An ounce of practice is worth more than tons of preaching"

Mahatma Gandhi

Multi utility control room at Stadtwerke Schwäbisch Hall



Renewable Energy / Energy Efficiency

1. Diesel Generator Control System

Remote monitoring for 10 DG sets

75 kVA DG — Gateway

30 kVA DG — Gateway

25 kVA DG — Gateway

25 kVA DG — Gateway

25 kVA DG — Gateway

25 kVA DG — Gateway

15 kVA DG — Gateway

15 kVA DG — Gateway

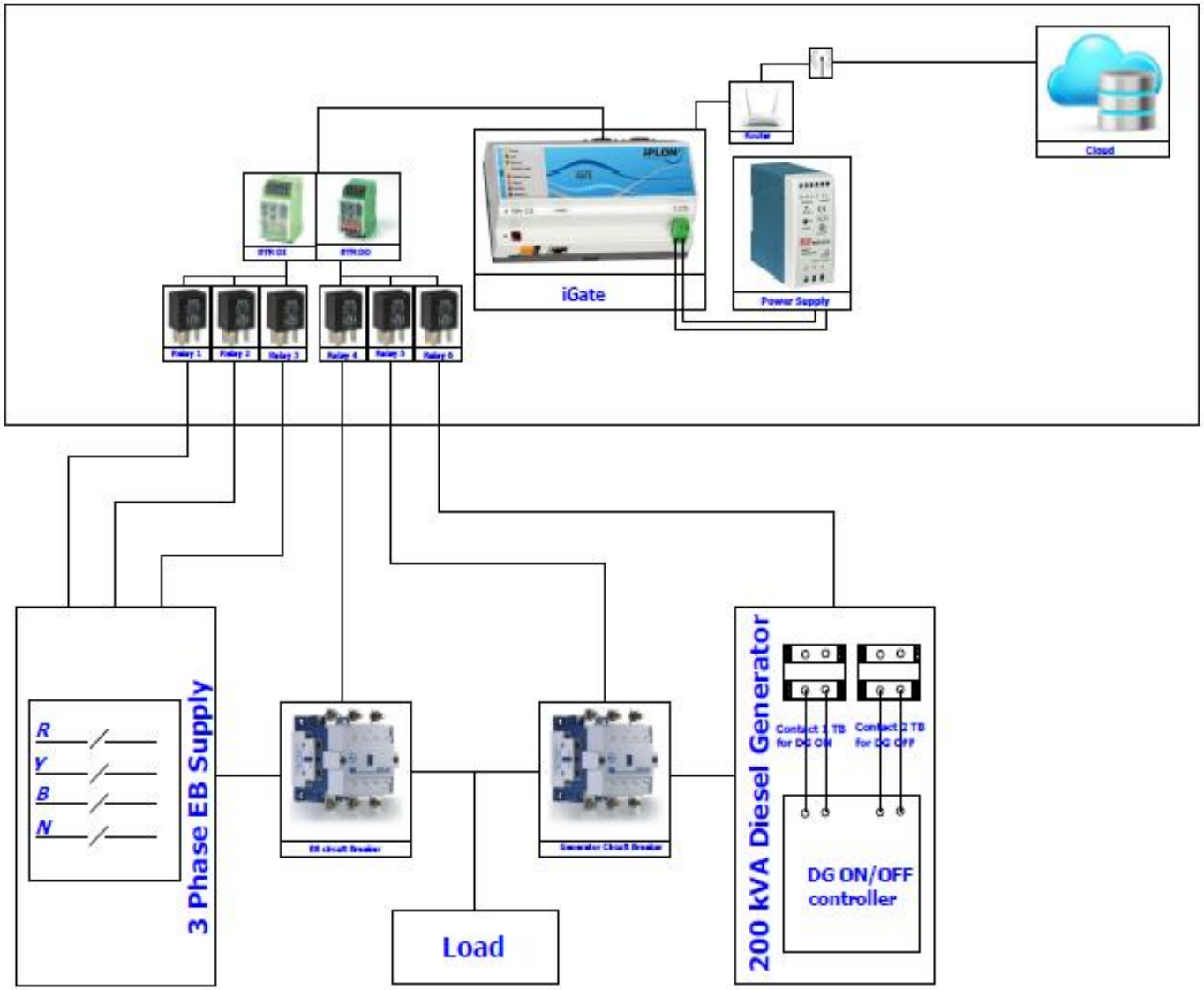
hosting cloud

FUTURE EXTENSIONS:

- Energy Managemenet Center
- Demand Side Management

Remote Monitoring for 10 DG sets | Architecture Monitoring System Single Line Diagram | IPLON GmbH, Karl-Kurz-Strasse 36, 74523 Schwäbisch Hall | Architecture Single Line Diagram

Remote Control of Diesel Generator in GRI

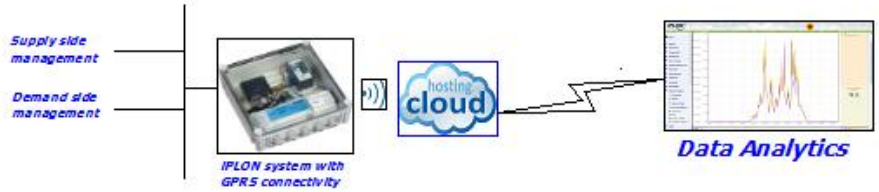


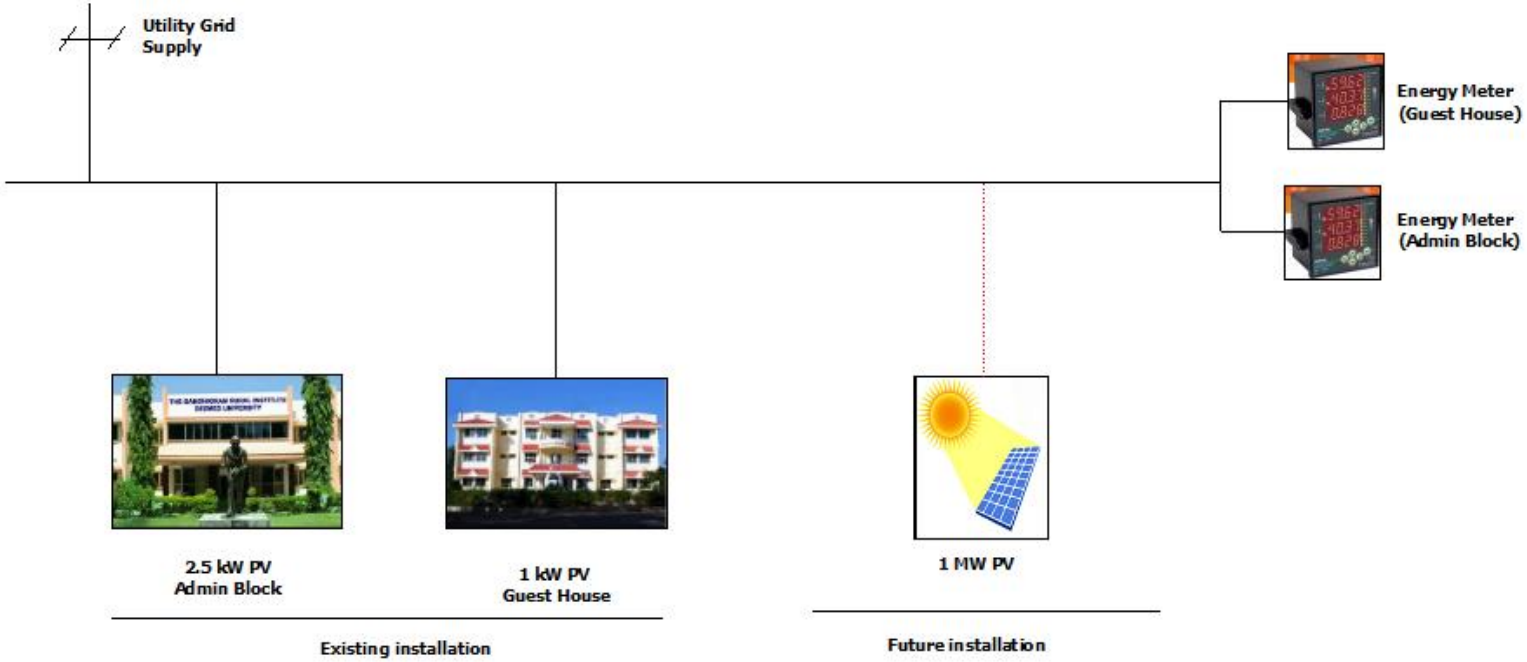
			Datum	20.09.16	Remote Control of Diesel Generator	IPLON GmbH Karl-Kurz-Straße 36, 74523 Schwäbisch Hall	Architecture Single Line Diagram	
			Bearb.	Lumine Dinja				
			Gepr.		Architecture Monitoring System Single Line Diagram			Drawing: 1001
Änderung	Datum	Name	Urspr.		Ersetzt durch	Ersetzt durch		

2. 1 MW Solar Plant (RESCO Model)

3. 110/22kV Substation

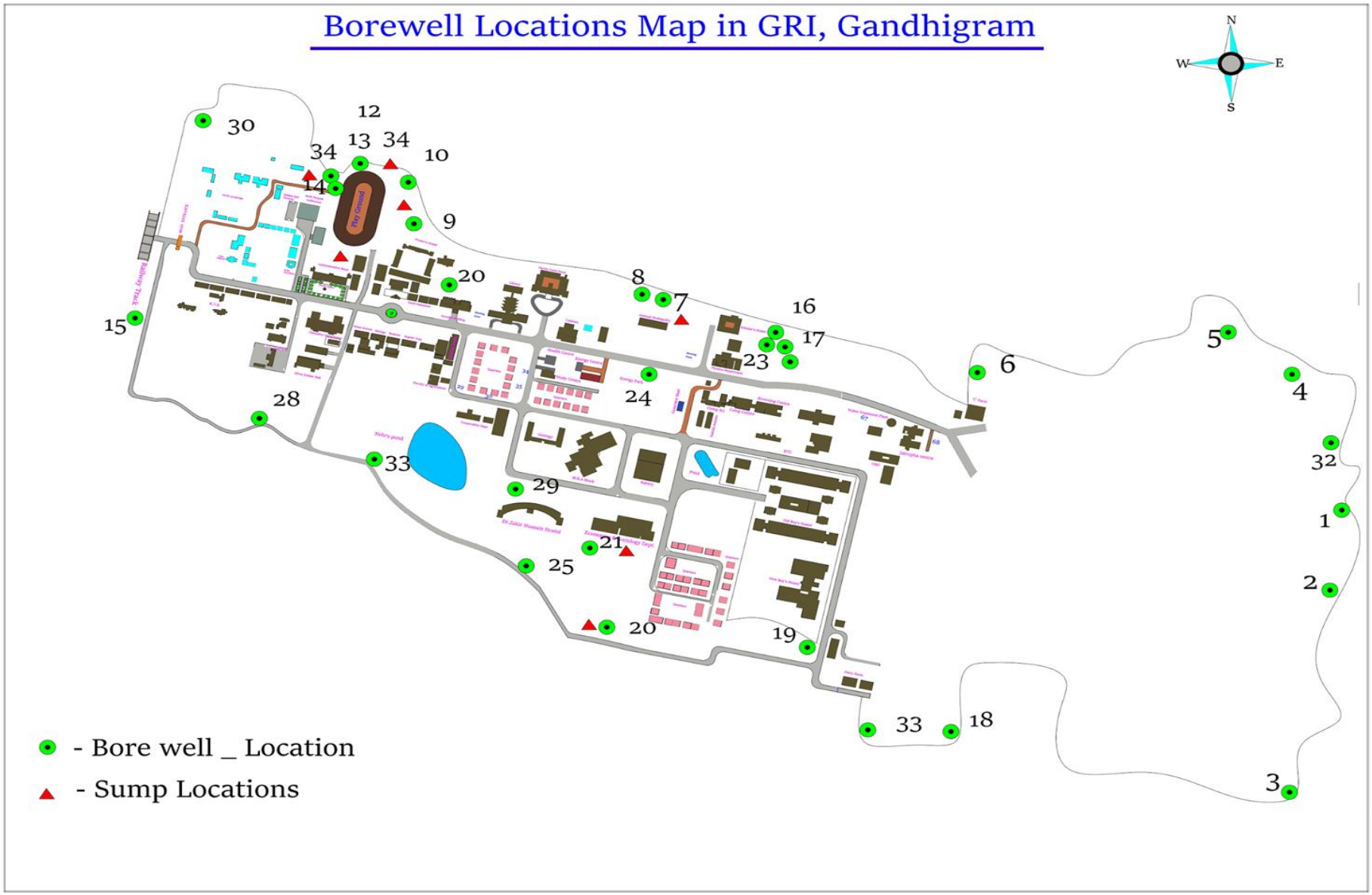
Logical View : Gandhigram Rural Institute





			Datum	11.08.16	Gandhigram Rural Institute - Deemed University	IPLON GmbH Karl-Kurz-Strasse 36, 74523 Schwäbisch Hall	Architecture Single Line Diagram	1.1
			Bearb.	Lumine Diwja				
			Gepr.					
Änderung	Datum	Name	Urspr.		Ersetzt durch	Ersetzt durch		Drawing 1001 Blatt 1 Blatt 1

Water Management



- No of borewells : 35
- Depth of borewell : 1200feet depth
- Requirement : 4 lakh lit/day
- Amount pumped : 3 lakhlit/day
- Girls and Boys Hostel : 1lakh lit/day/hostel
- RO plant capacity : 16,000 litres

Water Treatment Plant


TANK-B
TANK-A

Next Steps

- Mindset for Water management
- Get women from the local community involved as they are more interested to solve the water problems
- Water grid inside the campus (Pipelines)
- Finding the water leakages (equipment)
- Check topology for water pressure

- Study on water recycling at the Girls and Boys Hostel (Agriculture activities on hold because of Water shortage)
- Study on rain water harvesting possibilities
- Sewage Treatment Plant (1 for the campus)

Waste Management

1. Biogas Plant


"GREEN GAS"
1. MODEL : COMMERCIAL
2. BIOGAS OUTPUT - 20 TO 25 m³/DAY
3. LPG EQUIVALENT - 10 TO 12.5 KG/DAY
4. CO OFFSET - 86,232 TO 95,813 KG/YEAR
5. FOOD WASTE - 150 TO 200 KG/DAY
RECYCLE WASTE! SAVE FUEL! SAVE ENVIRONMENT!
DISPONSING FOOD, VEGETABLE, GARDEN WASTE ETC. IS NO MORE A PROBLEM. THIS MACHINE WILL CONVERT ALL THE BIO-DEGRADABLE WASTER INTO USEFUL RENEWABLE ENERGY CALLED "BIOGAS" WHICH CAN BE USED FOR COOKING/POWER GENERATION AND PRODUCTION OF ORGANIC MANURE, USING ANAEROBIC DECOMPOSITION PROCESS.
WHAT ELESE CAN YOU EXPECT FROM WASTE??
CONTACT : GREEN CONNECT
203/62, OPP.SUKRA FANCY, PAARAI VATTAM, ALAGAPURAM, SALEM - 636 013
Web : www. greenconnect.in, Email : greenconnectindia@gmail.com
greenconnect,Salem Cell : 081246-45694

- Works on the principle of Anaerobic digestion
- Used for cooking purpose in ladies hostel
- Waste consumption: 150 – 200 kg/Day
- Slurry is used for growing energy crops
- CO2 offset level: 86,232 to 95,813 kg/year

E-Mobility

1. Solar Powered Passenger Autorickshaw


(SOLAR STILL)

2. E-Bus


THE GANDHIGRAM RURAL INSTITUTE
MHRD - GOVERNMENT OF INDIA
SPEEDWAYS ELECTRIC
VEHICLE FOR THE DIFFERENTLY ABLED

E-Bus

- 230V AC is given to the converter circuit of 72V & 185Ah to obtain DC voltage.
- 6V batteries are connected in series to obtain 72 Volts.
- The AC induction motor of 7.5kW with 72V & 400A is used to power up the E-bus

E-Mobility Possibilities

- Solar Car-ports
- E-Bikes
- Production of Solar Rickshaws

Efficient Cooling Systems

Analysis Phase: What makes more sense?

- Central or De-central?
- Automatic temperature control (Building Automation)
- Consumption Pattern

- Because it supports creation of high quality rural jobs
- Makes use of clean and renewable energy (Grid stability issues)
- Leads to Smart Cities but Smarter VILLAGES
- Basic utilities for all (Energy and Water)
- Focusses on Decentralization leading to to transparency and independence
- It is the Future of Utilities Management
- Peak Oil; Climate Change

Why Gandhigram?

- Because of De-central thinking (Gandhian Principals)
- Past achievements
- Aware (respect for Energy, Water, Cleanliness)
- Domain Knowledge
- Possibility to make a difference is higher and faster
- Central Government funded University
- Already motivated

- Close to Chennai (45 people, 7 from Gandhigram)
- Close to the Mountains and the Sea :)
- Human resources at the University

How do we achieve together?

- GRI's involvement in implementation (to make it sustainable)
- Encouraging Entrepreneurship and SMEs
- Association with Industry
- Knowledge Transfer Smart city Schwaebisch Hall (one of the best in the world) – Smart Village Gandhigram
- Partnership with German Universities and Smart grid & RE communities
- Student Exchange Program and Internships
- iPLON and its network (SMEs in Germany and India)
- Funding opportunities
- A people's movement (Gandhiji's way!!)

Students from Gandhigram

- Project Management (4 projects: 75 MW !)
- Electrical Engineering
- Marketing & Sales

- Manager, Stadtwerke Gandhigram
- Training and Workshops
- Whitepapers

- Organizational structure
- Bitrix24

- Technical Sales
- Forecasting
- BricsCAD

- Plant Performance Analysis
- O&M of solar plants
- Remote Support to various plants

- Embedded Systems
- Cloud Based Central Monitoring System

- Operation and Maintenance
- Testing & Quality

MOU | Commitment for Stadtwerke Gandhigram

On-going tasks

- DG Control System: 1st System implementation
- 1MW PV plant site survey: Amplus Solar

- Analysis of Water Management
- Analysis of Waste Management

- November 2016 : H. Peter Breuning visit
- February 2017 : H. Hermann-Josef Pelgrim visit (to be confirmed)

- Masters projects with iPLON Network

More pictures..

Historical Trend	Gandhian Proposal
1. Multiplication of wants	Limitation of wants.
2. Diffusion of large scale technology	Large scale technology in a few sectors coexisting with small-scale technology and handicrafts in others.
3. Mass Production	Sm[illegible]ale production,except in a few sectors where mass production is unavoidable.
4. Centralisation of economic power	Limited state ownership, widespread village ownership and trusteeship.
5. Rapid urbanisation	Self-governing village republic,self-sufficient in basic needs.
6. Inequality (ameliorated by progressive taxation and social insurance)	Equality of wages and concessions made by Gram panchayat as per nature of the work.
7. Increasing specialization	Universal physical labour.





iPLON


iPLON
WORKSHOP ON
SMART GRID PROJECTS
16th August 2016
Rural Energy Centre
The Gandhigram Rural Institute - Deemed University

Thanks

Sreenath C
iPLON India Pvt. Ltd
sreenath@iplon.de
www.iplon.de. www.iplon.in
www.re2tn.org

Gandhigram website:
http://www.ruraluniv.ac.in/

Water Management as key factor for the success of Stadtwerke

Presented by:
Abhijit Singh Sachdeva &
Peter Breuning

Some Points regarding Water in India

1. Mindset
2. Leakage
3. Topology of water supply

Water Management requires good operation and maintenance

Women: Ideal change agents

Sewage Treatment- Comparison between Germany and India

- India is 11 times the size of Germany
- Sewage plants in Germany: 9300
- Sewage plants in India : 816!!

Out of the 816-

- Operational: 522
- Non-operational: 79
- Under construction: 145
- Proposed: 70

(Figures of 2014)

iPLON® The Infranet Company

Chennai Water Scenario

- Present day required amount: 1200 mld
- Amount of water received: 985 mld
- Expected demand: 2100 mld by 2031

Source: Wikipedia

Gandhigram Scenario

No of borewells : 35

Depth of borewells : 1200 feet

Requirement : 400,000 lit/day

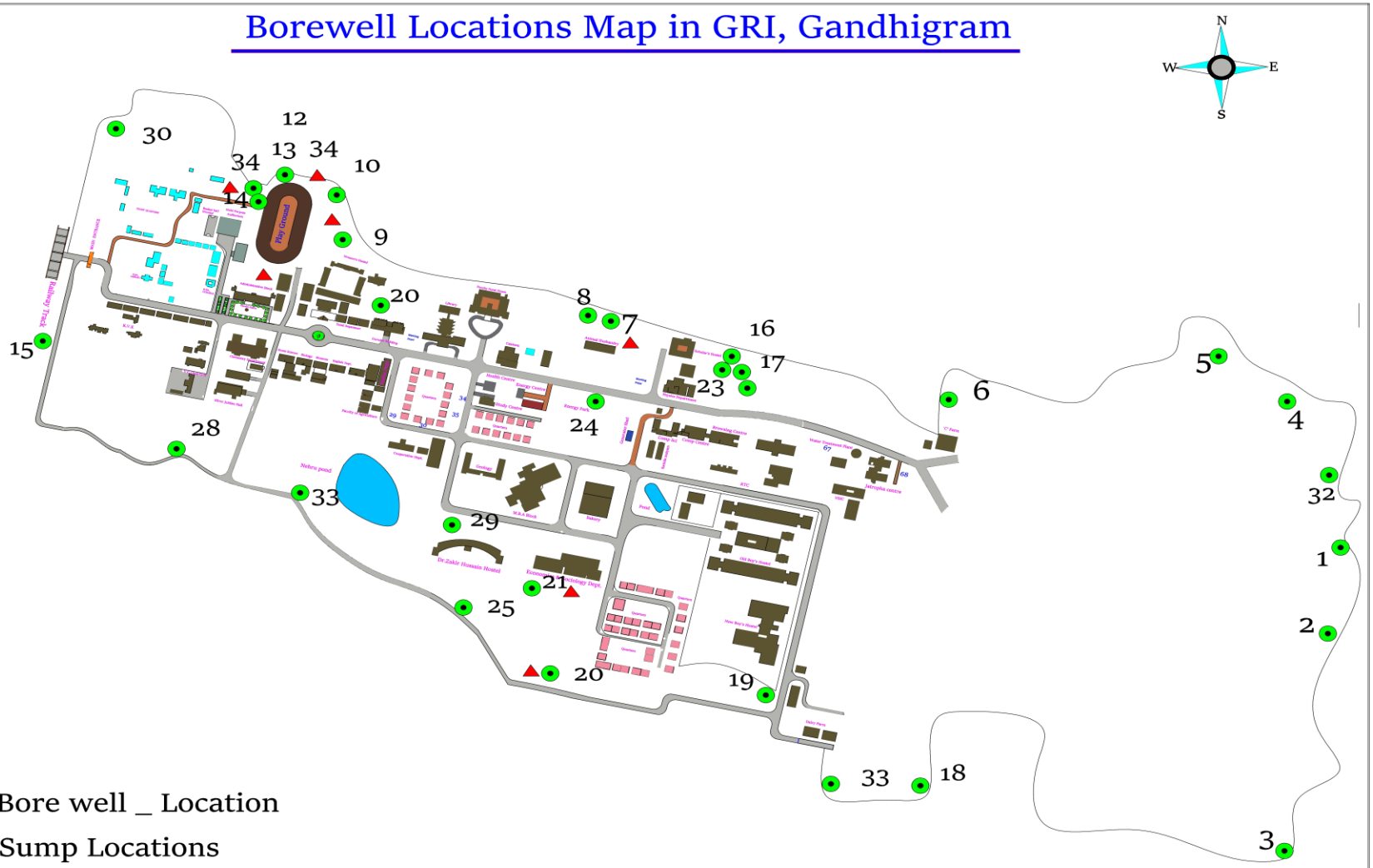
Amount pumped : 300,000 lit/day

Girls Hostel : 100,000 lit/day

Boys Hostel : 100,000 lit/day

RO plant capacity : 16,000 litres

Borewell Locations Map in GRI, Gandhigram

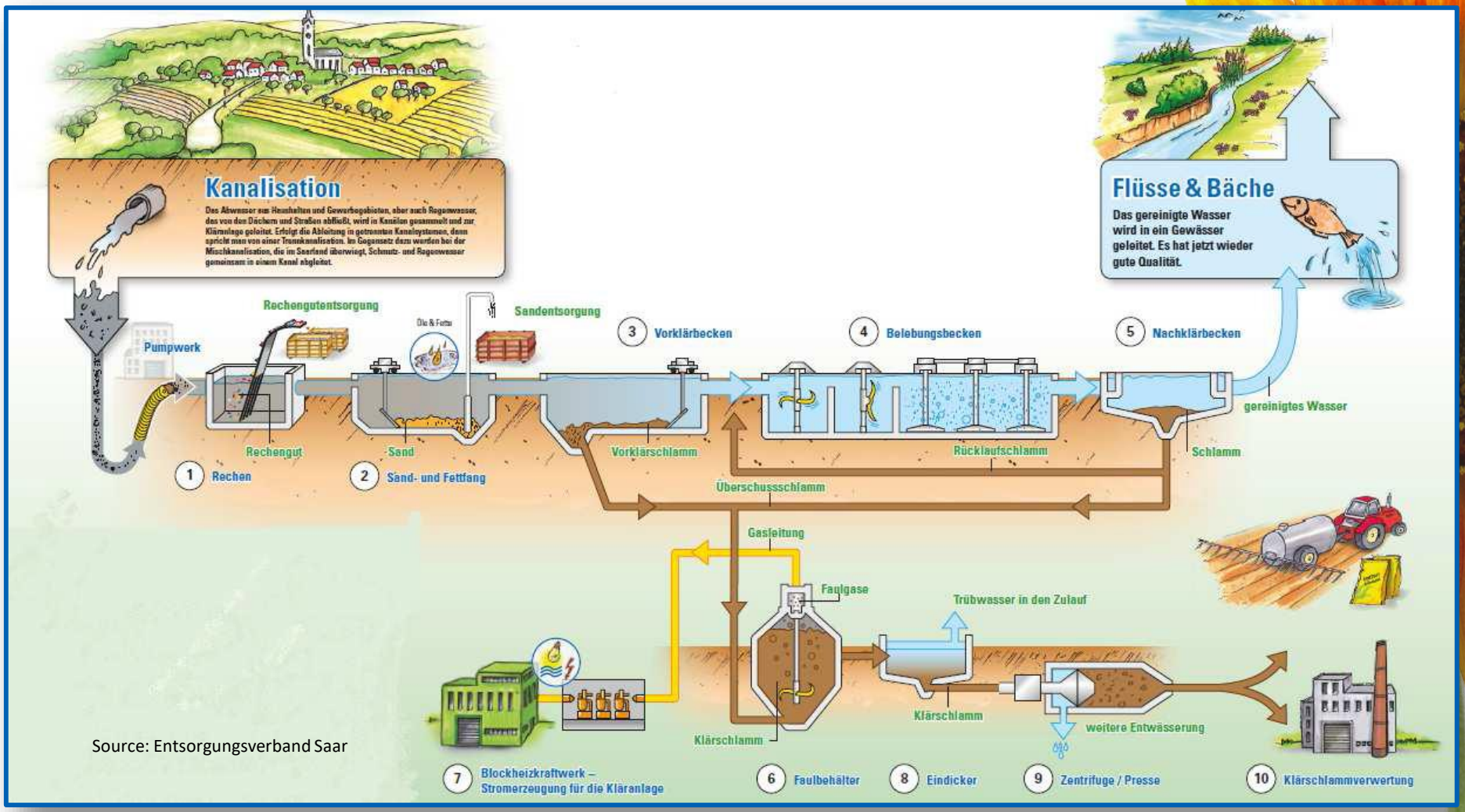


5 HP motor

3 HP motor


TANK-B
Sintex
TANK-A
Sintex

Waste water Treatment

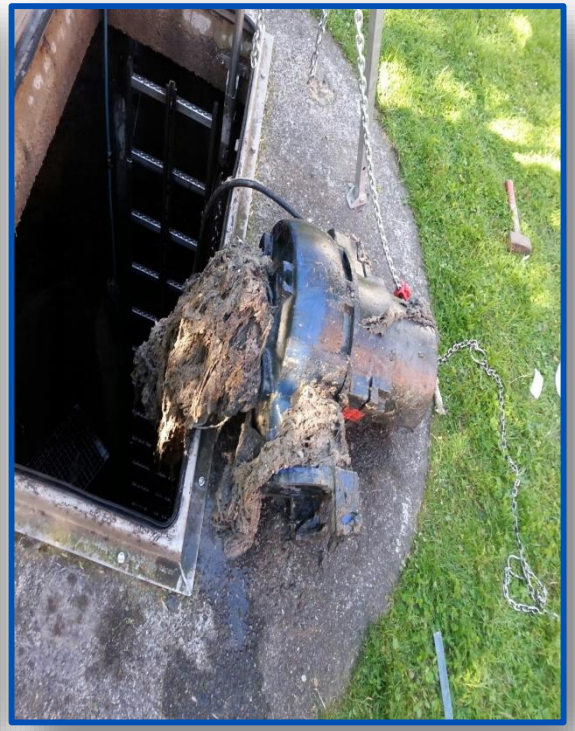


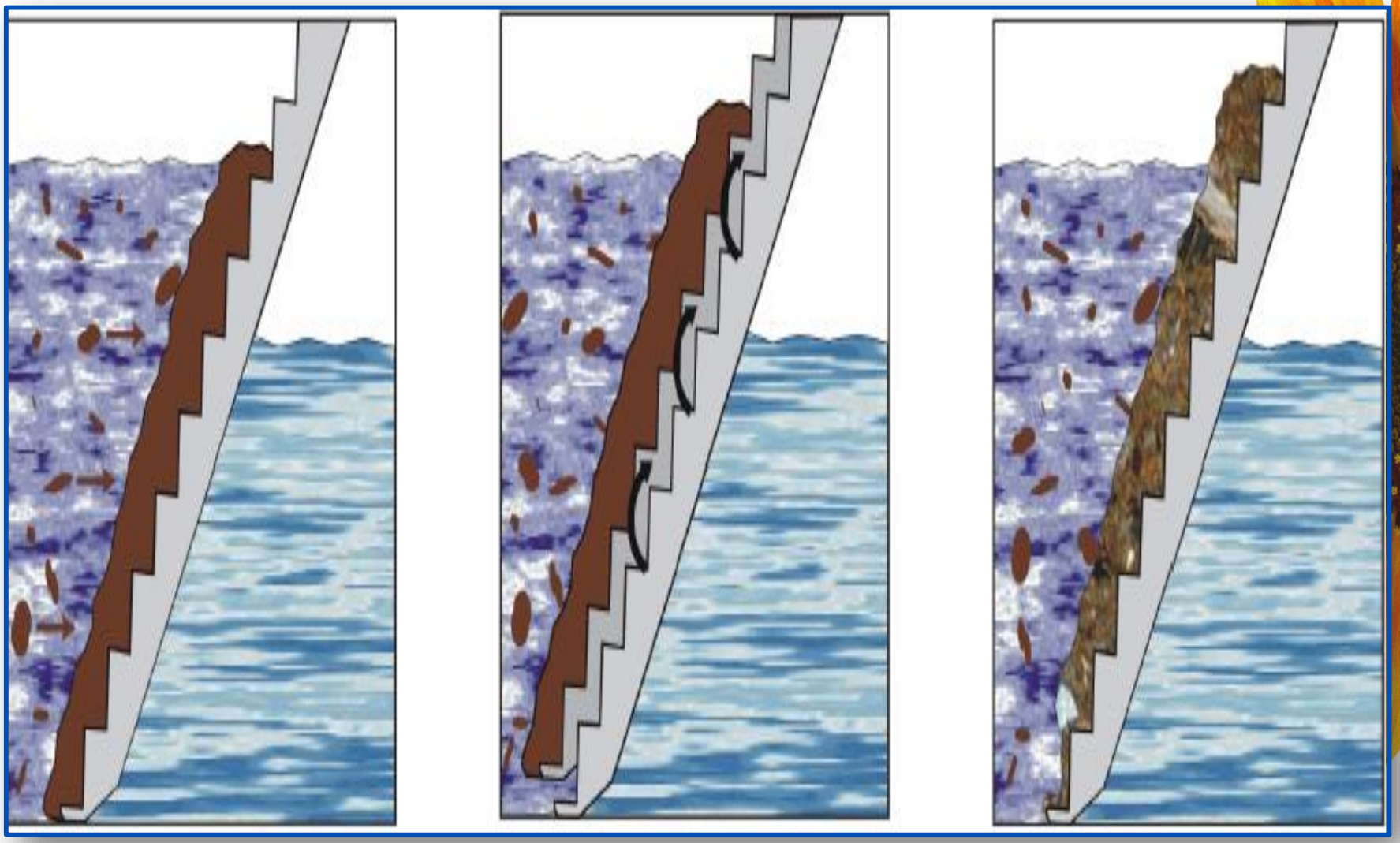
Source: Entsorgungsverband Saar

Mechanical and electrical equipment / installations for

- Wastewater treatment plants
- Wastewater pump stations
- Rainwater catchment
- Stormwater tanks

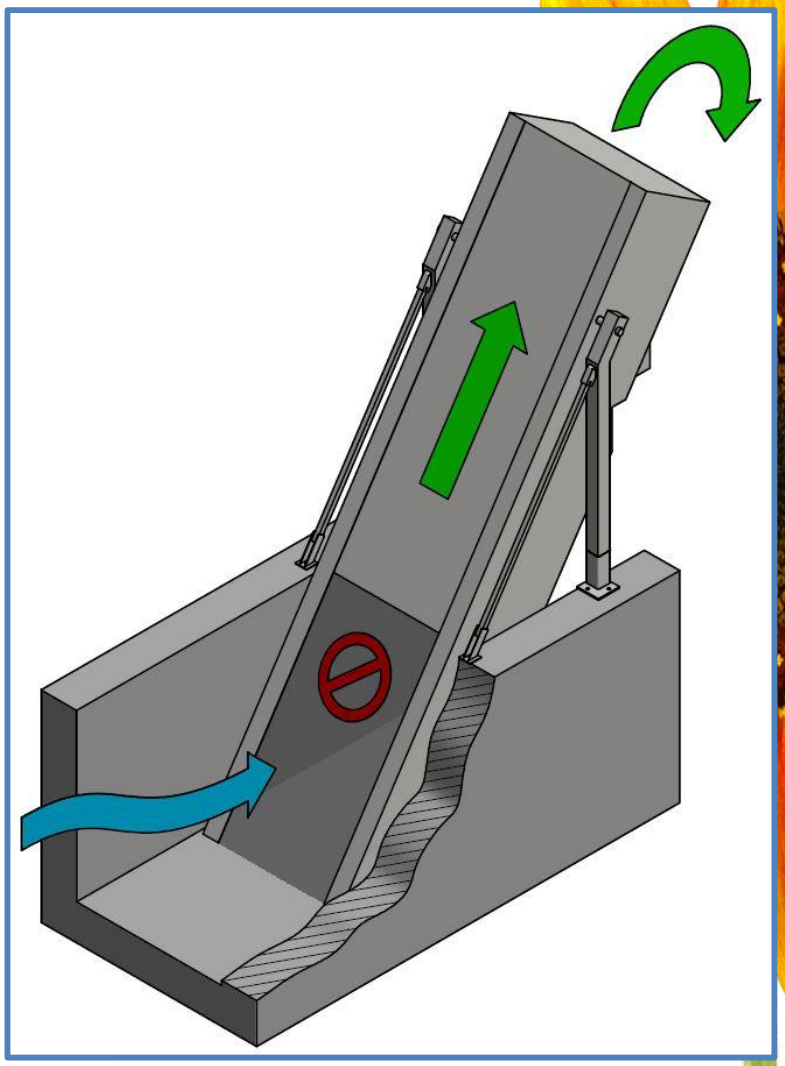
Water Management requires good operation and maintenance

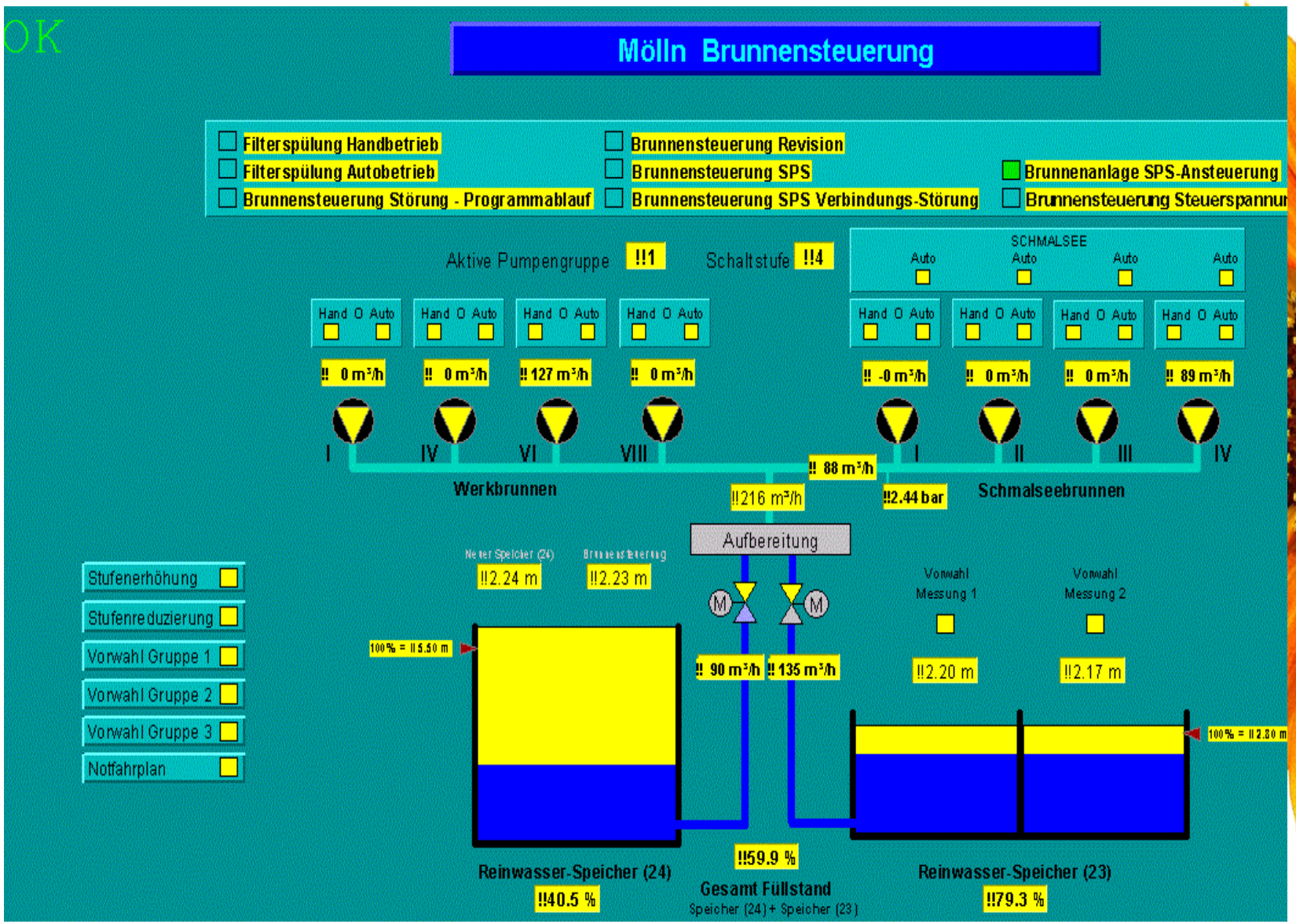


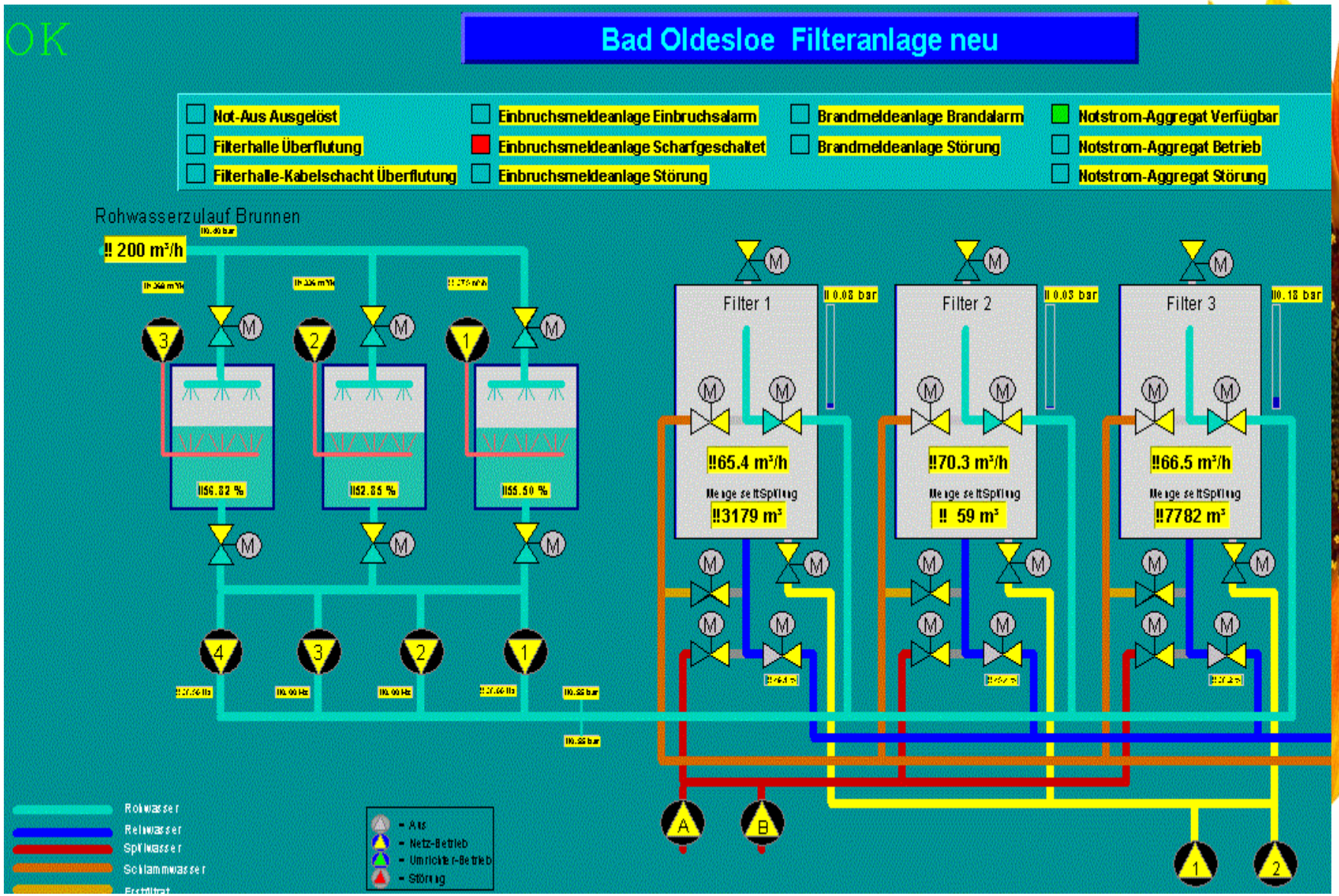


Screen tasks

1. Control the water flow
2. Hold back solid matter
3. Transport the screenings
4. Discharge




OK
Mölln Brunnensteuerung
Filterspülung Handbetrieb
Filterspülung Autobetrieb
Brunnensteuerung Störung - Programmablauf
Brunnensteuerung Revision
Brunnensteuerung SPS
Brunnensteuerung SPS Verbindungs-Störung
Brunnenanlage SPS-Ansteuerung
Brunnensteuerung Steuerspannur
Aktive Pumpengruppe !!1
Schaltstufe !!4
SCHMALSEE
Auto
Hand O Auto
!! 0 m³/h
!! 127 m³/h
!! -0 m³/h
!! 89 m³/h
I
IV
VI
VIII
II
III
!! 88 m³/h
Werkbrunnen
!!216 m³/h
!!2.44 bar
Schmalseebrunnen
Aufbereitung
Stufenerhöhung
Stufenreduzierung
Vorwahl Gruppe 1
Vorwahl Gruppe 2
Vorwahl Gruppe 3
Notfahrplan
!!2.24 m
!!2.23 m
Vorwahl Messung 1
Vorwahl Messung 2
!!2.20 m
!!2.17 m
100% = !!5.50 m
100% = !!2.80 m
!! 90 m³/h
!! 135 m³/h
!!59.9 %
Reinwasser-Speicher (24)
!!40.5 %
Gesamt Füllstand
Speicher (24) + Speicher (23)
Reinwasser-Speicher (23)
!!79.3 %


OK
Bad Oldesloe Filteranlage neu
Not-Aus Ausgelöst
Filterhalle Überflutung
Filterhalle-Kabelschacht Überflutung
Einbruchsmeldeanlage Einbruchsalarm
Einbruchsmeldeanlage Scharfgeschaltet
Einbruchsmeldeanlage Störung
Brandmeldeanlage Brandalarm
Brandmeldeanlage Störung
Notstrom-Aggregat Verfügbar
Notstrom-Aggregat Betrieb
Notstrom-Aggregat Störung
Rohwasserzulauf Brunnen
!! 200 m³/h
Filter 1
Filter 2
Filter 3
!! 0.08 bar
!! 0.08 bar
!! 0.18 bar
!!65.4 m³/h
!!70.3 m³/h
!!66.5 m³/h
Menge seitSpülung
!!3179 m³
!! 59 m³
!!7782 m³
Rohwasser
Reinwasser
Spülwasser
Schlammwasser
= Aus
= Netz-Betrieb
= Umrichter-Betrieb
= Störung

Next Steps in Gandhigram

- Awareness & Analysis (Water leakage and topology)
- Training for Self Help groups
- Recycling of water
- Coupling Waste water treatment and CHP Plants
- Containerized Sewage Treatment plant

Live Demo of Water and Waste Water management

Thank You!

www.iplon.de

www.youtube.com/user/iPLONChannel

The Ziegenbalg-Museum Tharangambadi

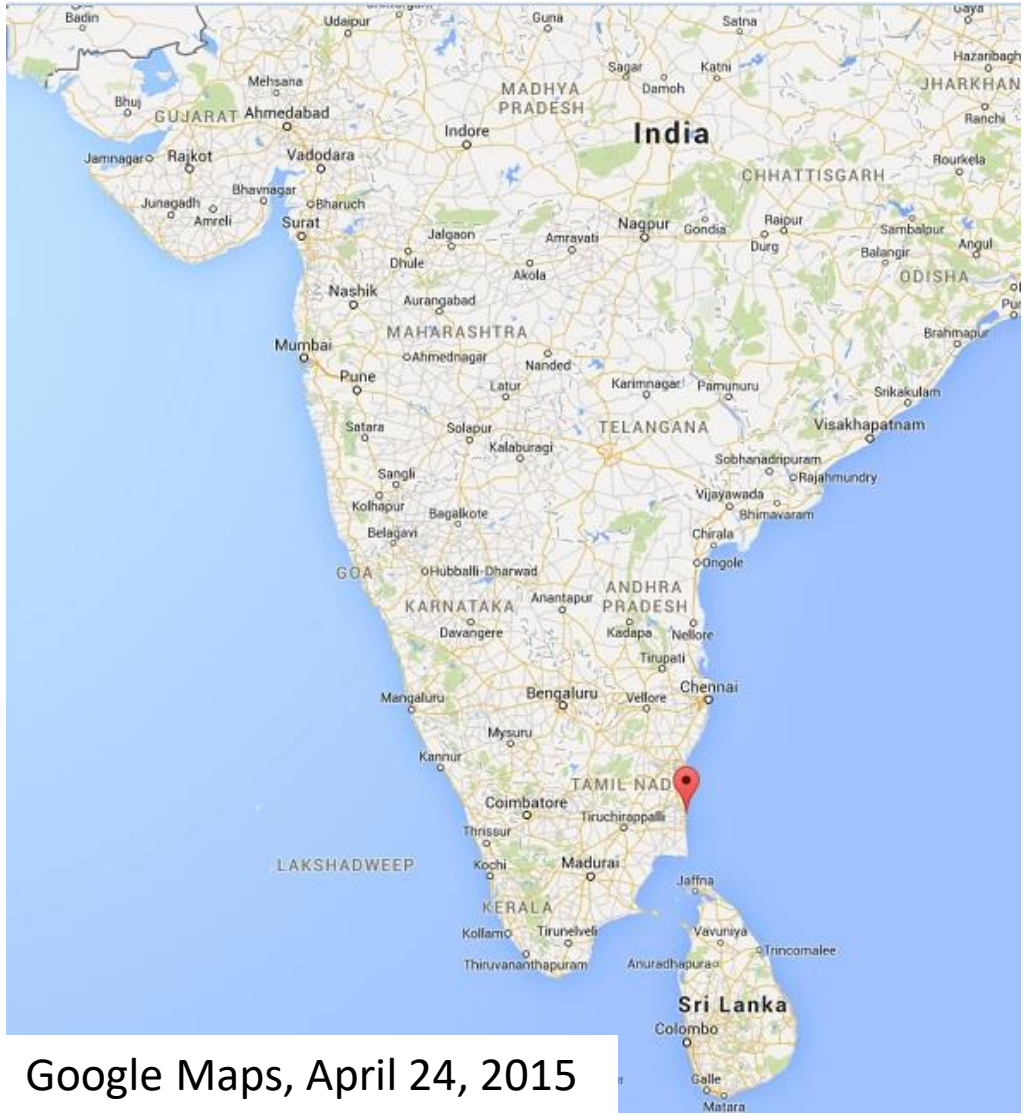
Jasmin Eppert, Ev.-Lutheran Mission Society of Lower Saxony

Project Holder

iPLON-Conference

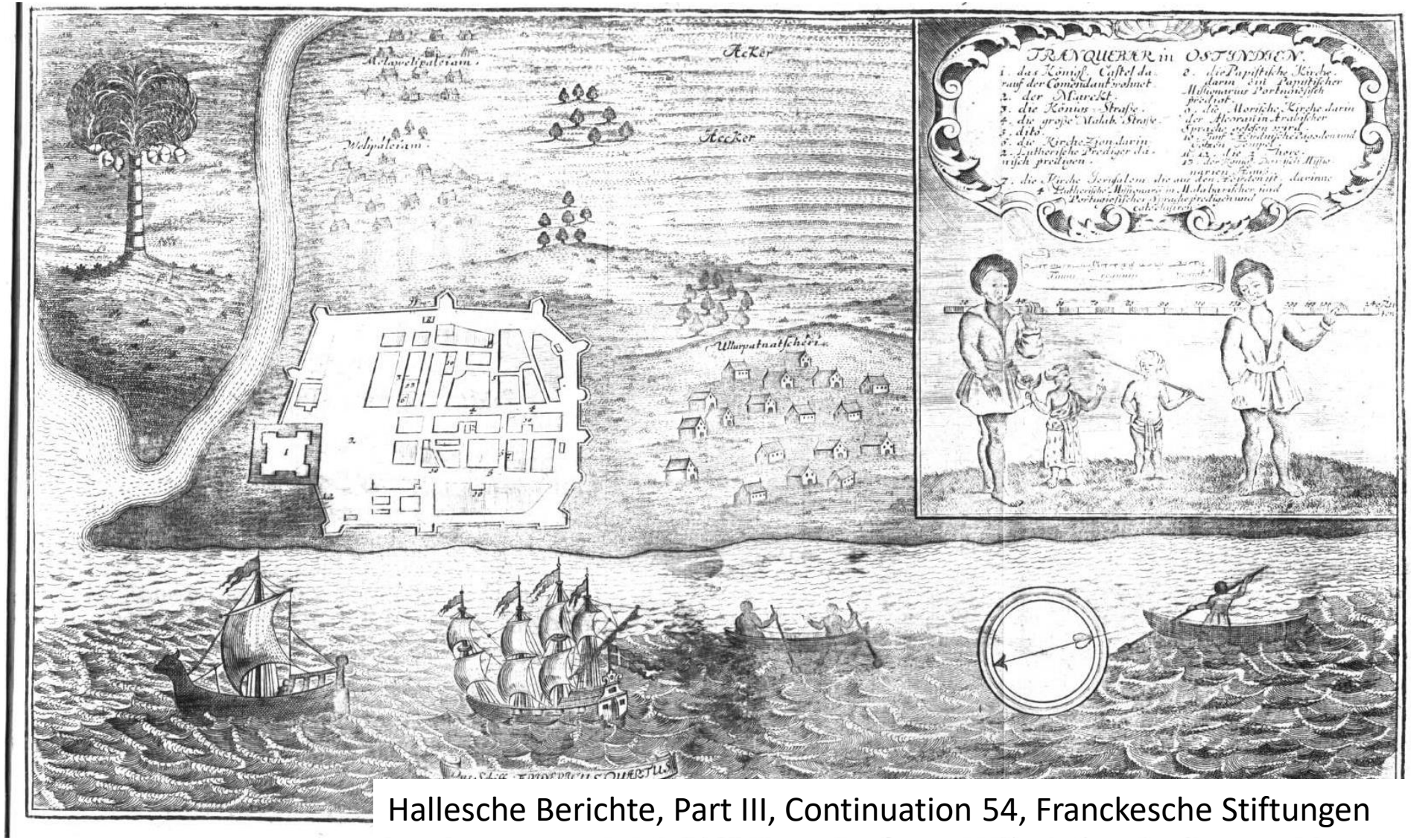
Chennai, November 24, 2016

Tharangambadi



Google Maps, April 24, 2015

The former Danish Colony Trankebar,



Hallesche Berichte, Part III, Continuation 54, Franckesche Stiftungen

Danish Towngate

Foto C. Kuehne, Aug. 2015

Tharangambadi, aerial perspective

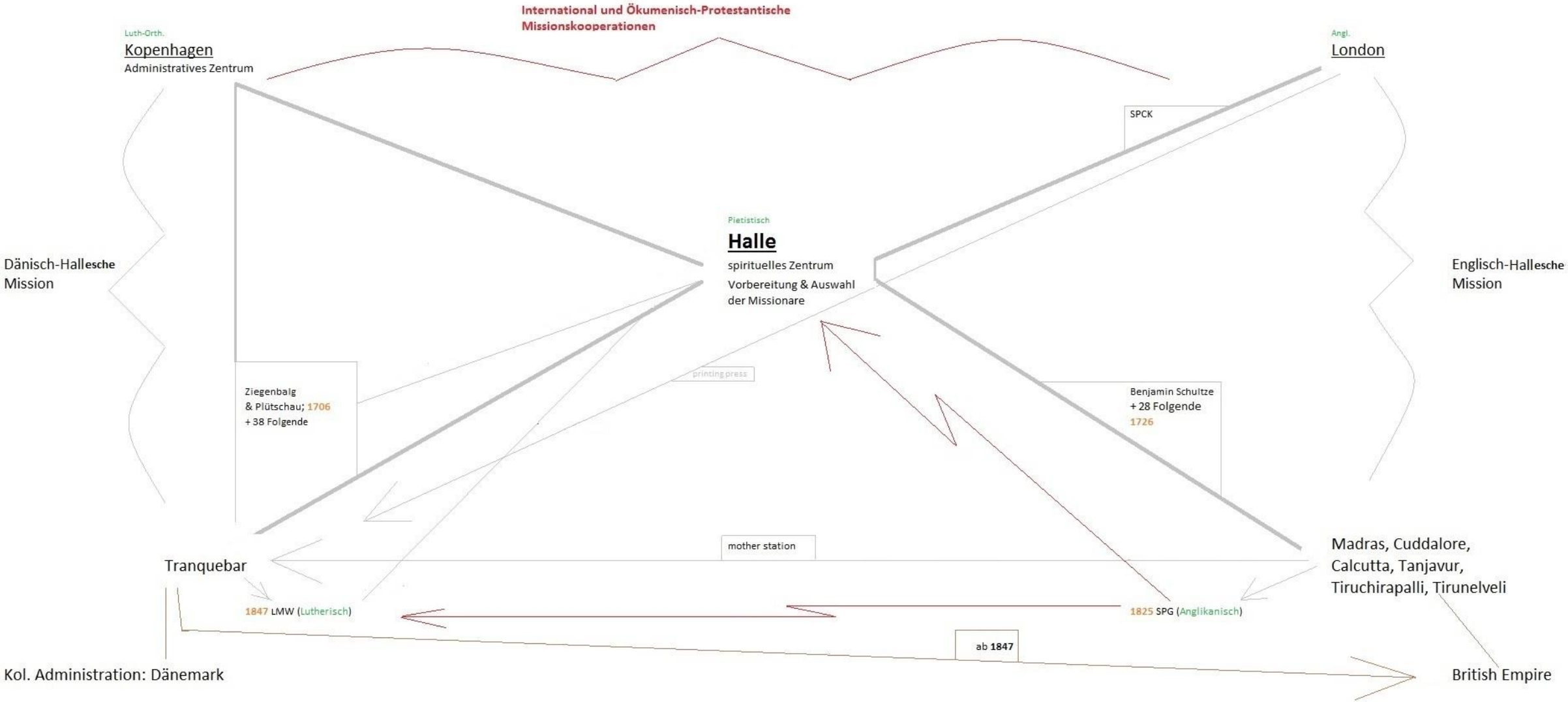
Bing Maps, April 24, 2015

Tharangambadi Today

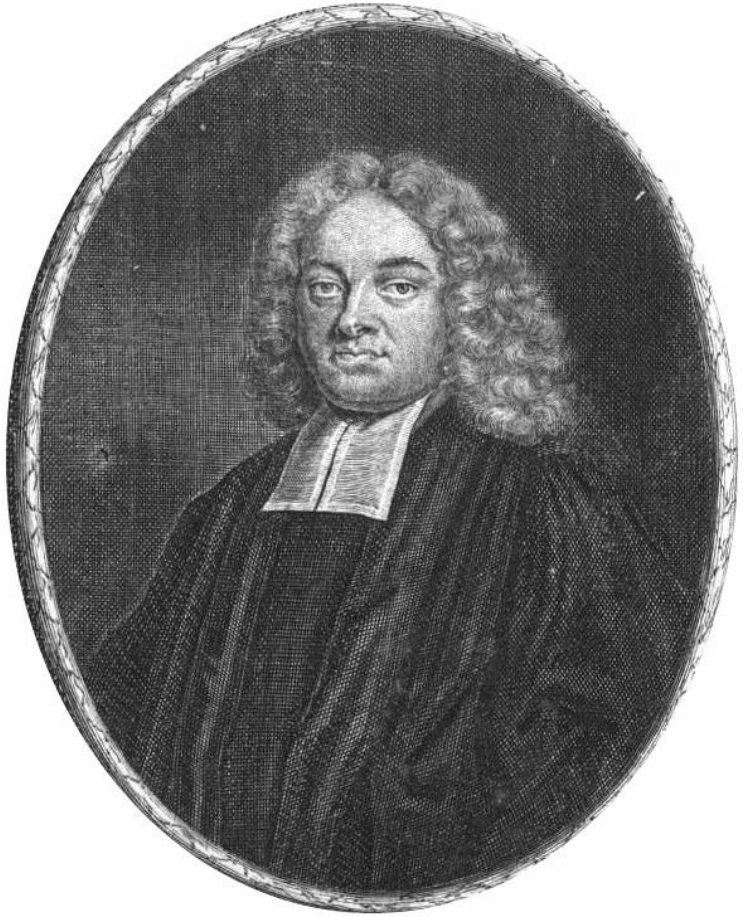
Foto C. Kuehne, Aug. 2015

Tharangambadi Today

Foto C. Kuehne, Aug. 2015


International und Ökumenisch-Protestantische Missionskooperationen
Luth-Orth.
Kopenhagen
Administratives Zentrum
Angl.
London
SPCK
Pietistisch
Halle
spirituelles Zentrum
Vorbereitung & Auswahl der Missionare
Dänisch-Hallesche Mission
Englisch-Hallesche Mission
printing press
Ziegenbalg & Plütschau; 1706 + 38 Folgende
Benjamin Schultze + 28 Folgende 1726
mother station
Tranquebar
Madras, Cuddalore, Calcutta, Tanjavur, Tiruchirapalli, Tirunelveli
1847 LMW (Lutherisch)
1825 SPG (Anglikanisch)
ab 1847
Kol. Administration: Dänemark
British Empire

Bartholomew Ziegenbalg



Indian Postal Stamp, 1956

Hallesche Berichte, Part I, Continuation 2, Franckesche Stiftungen

Aaron, the first ordained pastor in India

Hallesche Berichte, Part I, Continuation 6, 1732 Franckesche Stiftungen

Partners

ELM Hermannsburg
Partner in Mission

Evangelic-Lutheran Mission Society of Lower Saxony

FRANCKESCHE STIFTUNGEN ZU HALLE

The Francke Foundations of Halle

Evangelisch-Lutherisches
Missionswerk Leipzig

The Leipzig Mission

The Tamil Evangelical-Lutheran Church

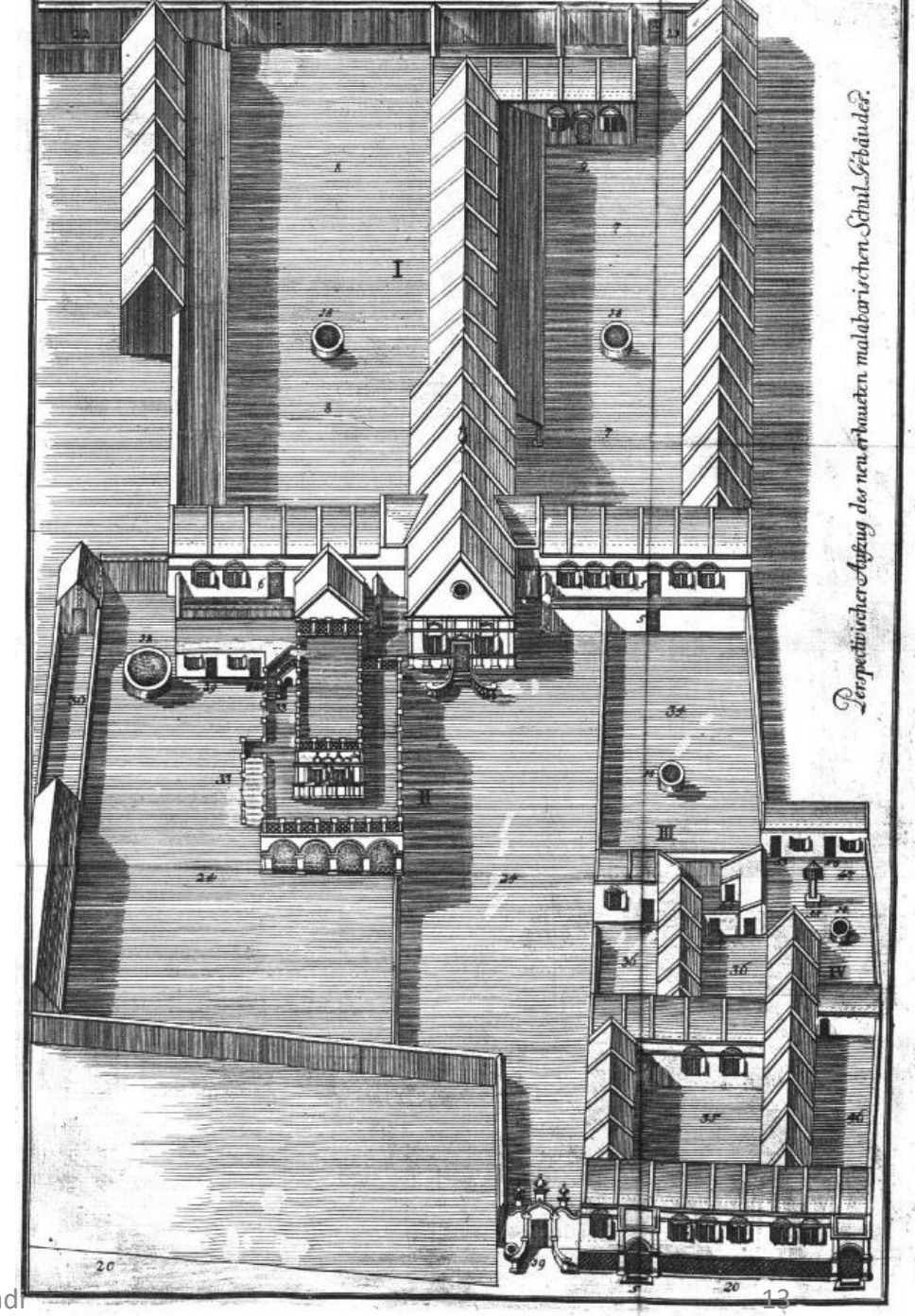
INTACH
PONDICHERRY

The Indian National Trust of Art and Cultural Heritage

Further Partners

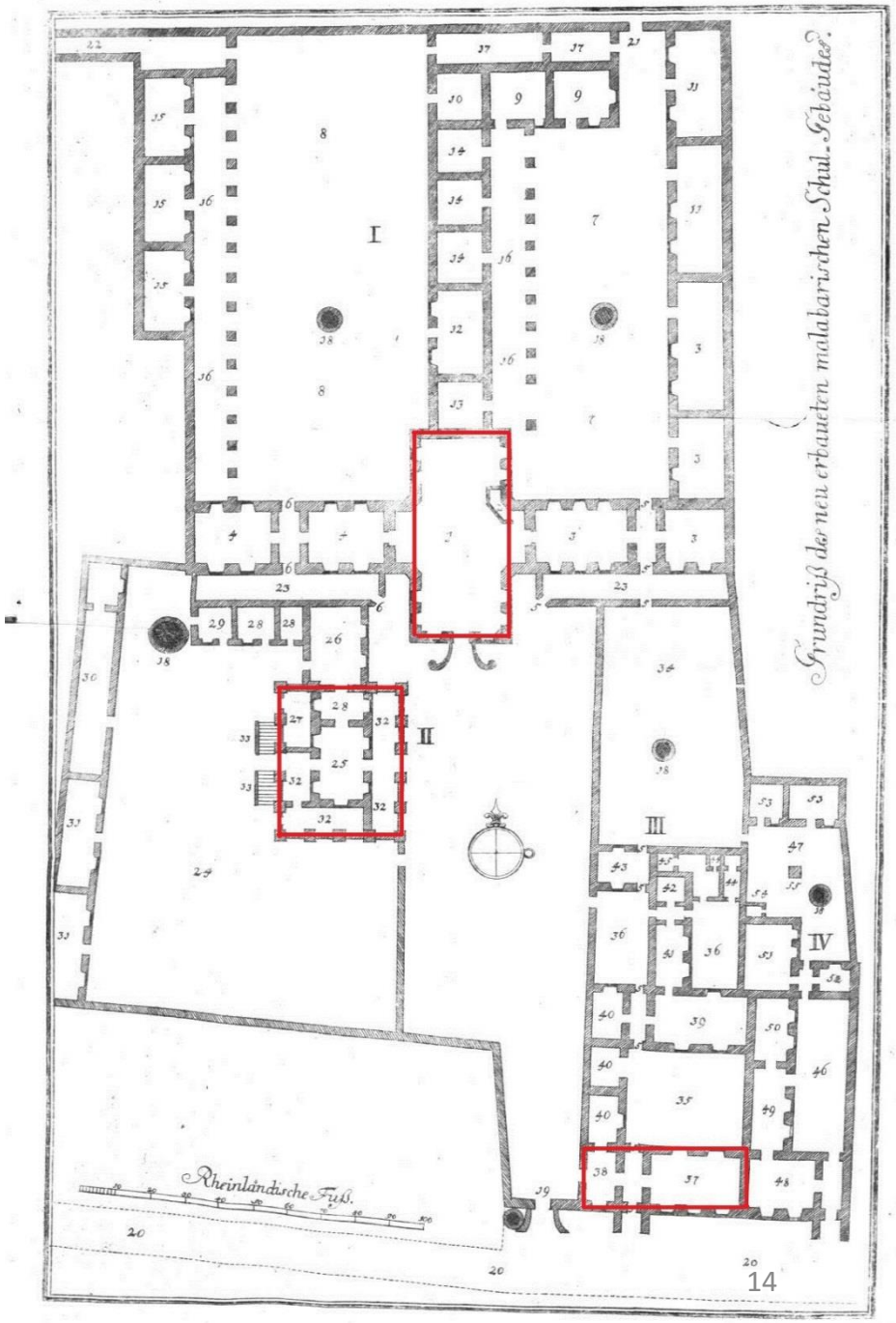
- The German Federal Foreign Office
- The Salem Offset Printers‘ Association
- Bread for the World, Germany

Perspective Drawing, 1741



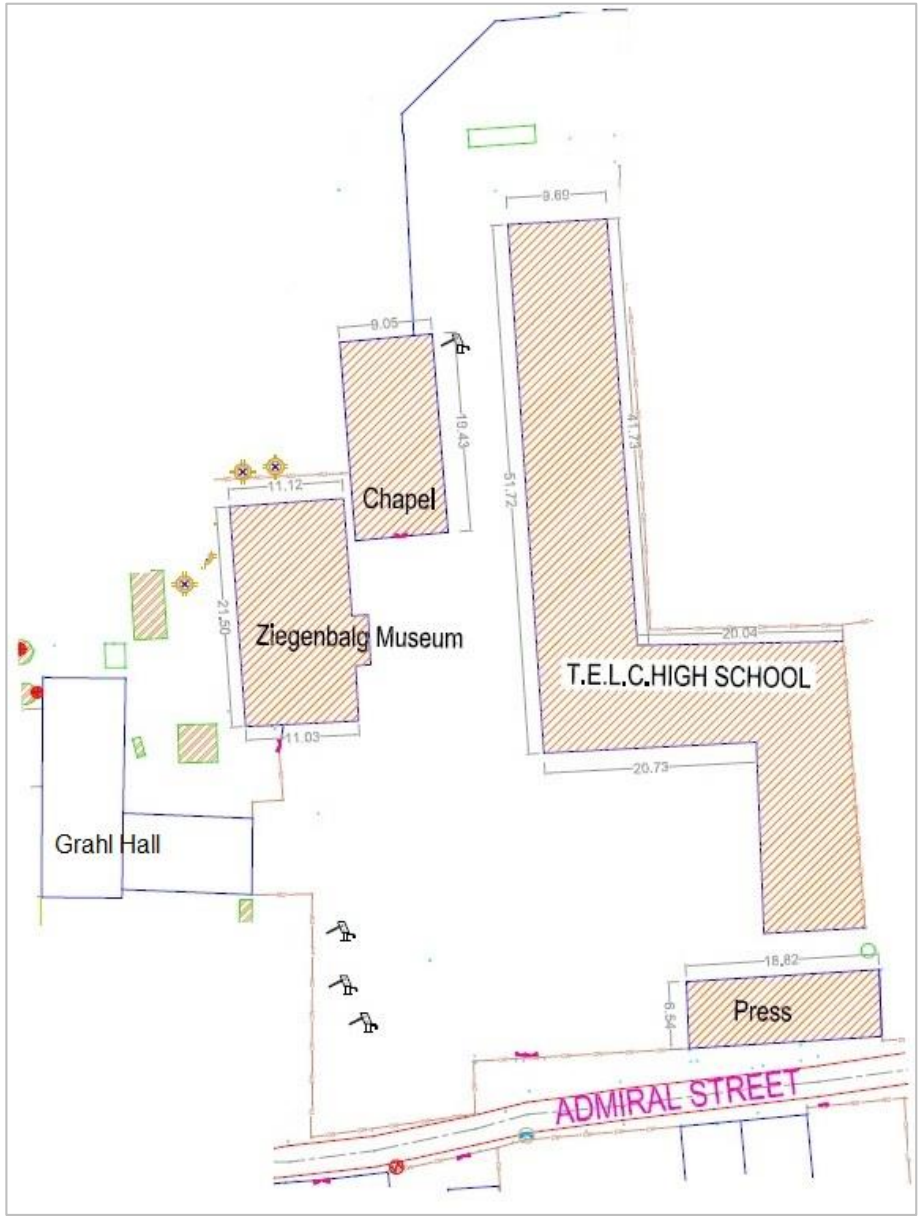
Hallesche Berichte, Part III, Continuation 54, Franckesche Stiftungen

Drawing 1741



Hallesche Berichte, Part III, Continuation 54, Franckesche Stiftungen

The Campus Today



Campus Drawing, Pondicherry Survey, 2006

Parts of the Complex Today

Foto J. Eppert, June 2015

1) “Ziegenbalg House”

Foto: Heiner Heine, July 2016

1) The Ziegenbalg House

- Former living house of Bartholomew Ziegenbalg
- 2 levels on ca. 420 square metre
- 13 rooms: 4 halls of 30-35 square metre
- 2 balconies, 2 verandahs, 1 roof top terrace
- Construction work started in July 2016
- Museum will be ready to open from Febuary 2017 on

Foto: Heiner Heine, July 2016

2) ”Prayer Hall“

Foto Heiner Heine, July 2016

2) The Prayer and Assembly Hall

- Prayer Hall
- Built in 1741
- Central building on the mission and education campus
- 1 levels on ca. 175 square metre
- Future Plans: Multi Purpose Hall:
- Concerts and Presentations, marriages and divine services, workshops and discussions

2.1 “Prayer Hall”

Foto J. Eppert, October 2016

Foto J. Eppert, June 2015

3) Dorothea Ziegenbalg House

3) The Dorothea Ziegenbalg House

- Propably built in 1741
- Living house of missionaries
- 1 level with two rooms on 123 square metre
- Contemporarily: information centre
- Future plans: research centre and artists in residence area

3.1 Dorothea Ziegenbalg House

4) The Grahl Hall

Foto: Heiner Heine, October 2016

4) The Grahl Hall

- Propably built in the 1920s
- 2-wing building on 270 square metre
- Future Plans: Cafeteria and Guest House

Future Plans

Herbal Gardening
&
Livelihood Programmes

Research Centre
cum
Library

Interactive
Museum

Artists and Authors in
Residence

Planetarium
And much more

Future Plans and Activities

- Exchange Programme for students and researchers from India and Germany
- Artists and authors in residence programmes
- Translator Festival
- Paper Production and Printing Workshop
- 3-D Printing-Technology Course
- Star-Observations
- Language Summer Schools – Tamil and German
- Palm-Leave Writing → Handwriting Contest
- Photography Workshop
- Fishing in the past
- Historical Textile-Production
- Cooking Courses Tamil and European
- Film Project Francke Foundations

Sustainable Energy Concept

- E-Transport Systems
- Solar Cooling Systems for Vitrines, Kiosks etc.
- Workshops and trainings

Ziegenbalg Memorial, Tharangambadi

Foto J. Eppert, June 2015

History and Holiday: Come in and find out