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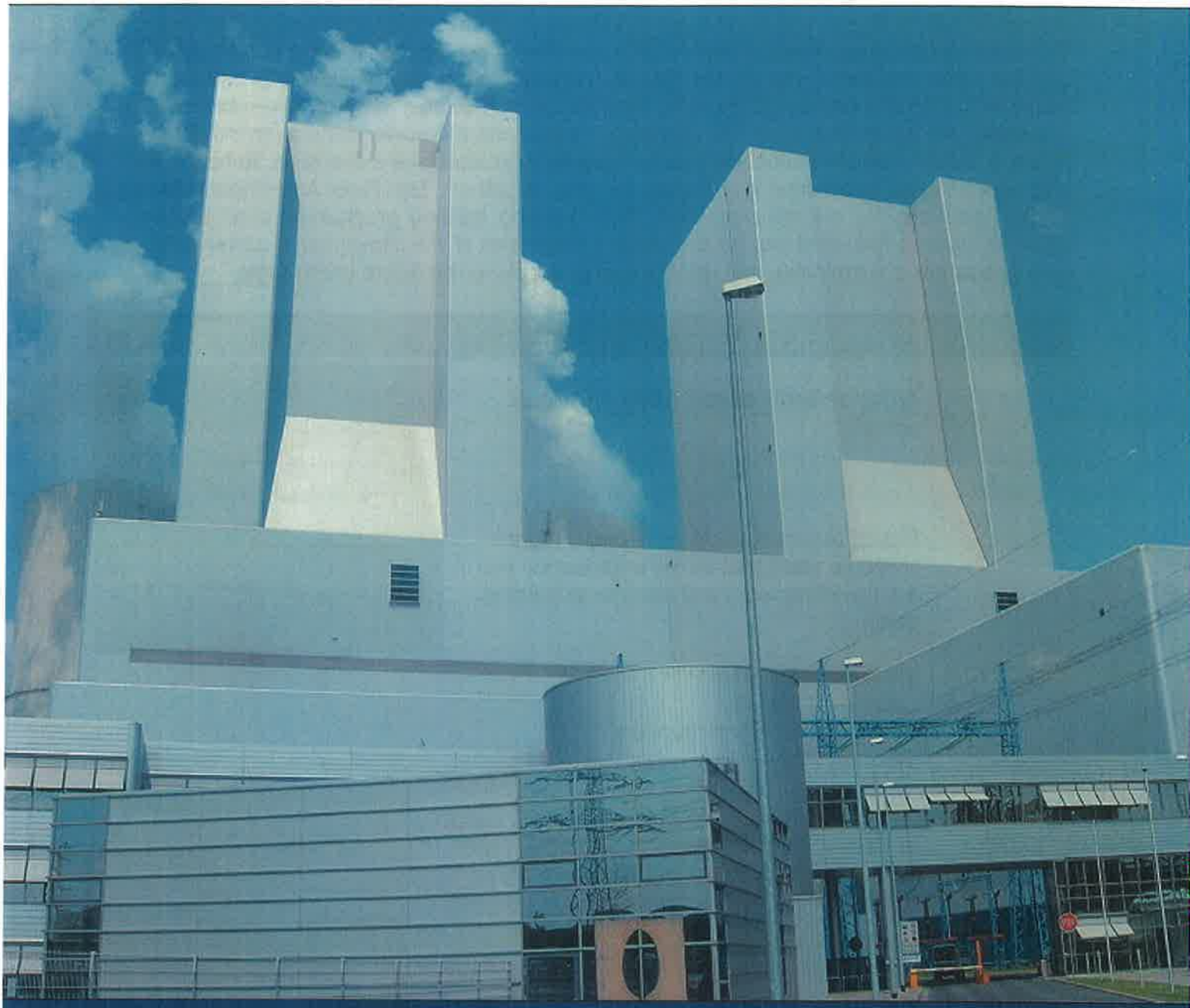

Study Tour

Flexibility options to adapt to fluctuating renewable energies

29th October till 5th November, 2017
Leipzig and Berlin, Germany

The Excellence Enhancement Center (EEC) and the Indo-German Energy Forum (IGEF) Support Office welcome you to the special training programme on flexibility options to adapt to fluctuating renewable energies from the 29th of October – 4th of November, 2017 in Leipzig and Berlin, Germany. The electricity market and the power generation industry is facing a radical transformation worldwide: Corporate structures are changing. Renewables and conventional generation are having to grow together. The Paris Agreement raises further demands for climate protection. The following training programme aims to give valuable input to find solutions for the present challenges of the conventional power sector who guaranties a sustainable and reliable energy supply in the future energy mix.

Sunday, 29th of October		
	Arrival at Berlin airport (BER) (individual arrival)	
	Pickup service from Airport (only if flight schedule was given to the organisation you are travelling with) and transfer to hotel in Berlin NH Kurfürstendamm**** Grolmanstr. 41-43 10623 Berlin – Charlottenburg Germany	
13:00	In case of early arrival: Meeting at hotel lobby and departure to restaurant	
19:30	Get-together and briefing for the delegation in the hotel with updated information on the agenda, hand-outs and more	
20:00	Dinner at Indian Restaurant in Berlin	

Monday, 30th of October (BERLIN)	
09:00	Assemble in Hotel lobby and depart through Coach for Site visit
09:30-11:30	Technology for a Smart Grid: Visit to EUREF-Campus At a glance: • Research campus for the federal government's "Mobility2Grid" • Uses biogas cogeneration to produce its own CO -neutral energy supply 2 • Smart grid / smart metering on campus • Testing platform for electro-mobility with the largest electric re-charging station in Germany • Home to around 100 companies and research institutions with approximately 2,000 employees Brief Description: The Campus is a symbol of the turnaround in energy policy in Germany and a unique location for companies in the fields of energy, sustainability and mobility. It already meets German government´s climate targets for 2050 and is the only centre for innovation and future projects of its kind in Europe. Since the beginning of site development, the EUREF- Campus has become home to renowned international companies - e.g. Cisco, Deutsche Bahn, Schneider Electric, Alphabet, General Electric, Hubject, and the Innovation Centre for Mobility and Societal Change and research institutions. The innovative community of global players, start - ups and research and educational institutions works in close cooperation across a wide range of partnerships to develop intelligent solutions for the city of the future. Our guide will introduce the campus and its different topics: mobility, energy and green buildings. EUREF  EUREF-Campus 1-25, 10829 Berlin Tel: +49 3026476720
11:45	Lunch at EUREF-Campus

12:30- 14:30	Session on Grid Operation: Visit to 50 Hertz (TSO) At a glance: • One of the four transmission system operators for electricity in Germany • Wholly owned by Eurogrid Gmbh • Covers 30% of Germany by Area Brief Description: 50hertz operates the transmission grid in the northern and eastern part of Germany. This electricity grid is one of the most recent in Europe. As a part of the European grid it is directly connected to neighbor countries such as Poland, Czech Republic and Denmark. 50hertz coordinates the interaction of all players of the electricity market in the federal states of Berlin, Brandenburg, Hamburg, Mecklenburg-Vorpommern, Saxony, Saxony-Anhalt and Thuringia.The grid of 50hertz covers an area of about 109,360 km² and has a length of about 10,000 km. 50hertz is responsible for the operation, maintenance, planning, and expansion of the 380/220 kilovolt transmission grid throughout the northern and eastern part of Germany. Our grid covers an area larger than 109,360 km² and runs a length of approx. 10,000 km – the distance from Berlin to Rio de Janeiro. It is the technical backbone that reliably supplies power to around 18 million people.	 New 50 Hertz office at Heidestrasse 2 (close to Main Railway Station)
15:00	Presentation of electric car sharing systems "car2go" and "DriveNow" Tbc Both companies are mobile app based carsharing systems They offer a wide variety of car models with the option to even drive electric cars In Berlin will be the opportunity to check the "BMW i3" and the "smart fortwo"	

15:30-19:30	Guided tour through Berlin The Reichstag Parliament building, Brandenburg Gate and the TV Tower – just three of the many top sights in the city. The Guided tour will cover the most famous sights.	
20:00	Dinner at Indian Restaurant	

Tuesday, 31st of October(LEIPZIG)		
08:00	Meeting at the hotel lobby after breakfast for field visits.	
08:30	Bus transfer to Leipzig	
10:30-12:30	Technical visit Stadtwerke Leipzig Medium size utility that has managed the transformation from old socialistic-centralistic power and distribution plants to the largest provider of electricity in the State of Saxony, Germany **Topics:** Power generation, distribution, load management and dissemination of renewable installation / generation Scheduling, balancing, energy forecasting Gas, district heating, solar generation, biomass	Leipziger Stadtwerke Großhandel/Erzeugung Stadtwerke Leipzig GmbH Eutritzscher Str. 14b 04105 Leipzig 29.09.16 Tel: +49 (341) 121-8280
13:00	Lunch at typical german restaurant	
14:00-15:00	**Alternative 1:** Reception and E-Mobility presentation at BMW Group	BMW Group
15:00-17:00	Exclusive guided tour in production of electric vehicles BMW i3 and i8. The BMW Leipzig plant is one of the most modern and sustainable automobile plants in the world. https://de.wikipedia.org/wiki/BMW-Werk_Leipzig	 BMW-Allee 1, 04349 Leipzig, Deutschland

14:00-17:00	**Alternative 2:** Lignite-fired power plant Lippendorf The Lippendorf 1,840 MW power plant is located in the Free State of Saxony, about 15 kilometers south of Leipzig, the city of fairs. The newly constructed plant generates base-load power and reaches a net efficiency of 42 %. The first unit was connected to the grid in June 1999 for the first time, the second connection to the power system followed half a year afterwards. With an investment volume of approx. 2.3 billion Euros, the new construction project of Lippendorf power plant was the largest private project in the Free State of Saxony realised after 1990. Standards have also been set in the field of environmental protection. In comparison with the specific emissions of the old plants (the reference year is 1990), the following reductions could be reached for each kilowatt hour supplied to the power system: by 44.6 % for carbon dioxide, by 99 % for dust, by 98 % for sulphur dioxide and by 73 % for nitrogen dioxide.	 VATTENFALL Hauptstraße 200; 04575 Neukieritzsch OT Lippendorf D +49343422 2611 M +491723019077
17:30-20:00	Transfer to Berlin with stop at a TESLA Supercharger Saale Autohof Bad Dürrenberg An der Autobahn 1 6231 Nempitz	
19:00	Lunch at Indian restaurant	

Wednesday, 1st of November (Berlin)

Workshop "System Integration of Variable Renewables – Focus on Supply Side Flexibility"

1 November 2017, 9:00-18:00 hrs - Berlin
Venue: Ministry for Economic Affairs and Energy (BMWi), Invalidenstr. 48, 10115 Berlin
Room: Große Aula
Participants: policy makers; technical experts; national authorities; private sector representatives

08:00	Meeting at the hotel lobby after breakfast and transfer in delegation bus to BMWi.
08:30	Registration and welcome coffee

Welcome and Introduction to Power System Flexibility Options

- growing flexibility requirements with higher shares of vRES
- wider perspective on flexibility including generation, grids and demand side

Moderator: Ursula Borak, Deputy Director General "International Affairs, Fossil Fuels and Nuclear Energy", Federal Ministry for Economic Affairs and Energy (BMWi)

09:00	Welcoming remarks By Thorsten Herdan, Director General for Energy Policy, Federal Ministry for Economic Affairs and Energy (BMWi)
09:15	Power System Flexibility in the German and European Context By Dr. Guido Wustlich, Head of Division IIIB1, "Electricity, Sector Coupling, Power Plants", Ministry for Economic Affairs and Energy (BMWi) • Link to platform electricity market and working group on flexibility • Reference to Discussion Paper "Electricity 2030" and "Electricity 2030 – Concluding Paper" • European Context
09:30	Integrating High Shares of vRES and Power System Flexibility: A TSO`s Perspective By NN, 50 Hertz • Role of transmission grids, regional and international grid interconnection • Changing demands for system operation Technological feasibility and cost/benefit implications

09:50	Power System Flexibility Requirements – Global Status and Outlook By Simon Müller, Head of Unit "System Integration of Renewables", International Energy Agency (IEA) • Global status of RE shares and curtailment rates • Existing demand for enhanced flexibility in the power system • Outlook
10:10	Q&A
10:30	Coffee-break

Enhancing flexibility of power plants – Part 1

- flexibility of conventional power plants
- technical and regulatory perspective

Moderator: Simon Müller, Head of Unit "System Integration of Renewables", International Energy Agency (IEA)

11:00	Showcase **INDIA** By NN, NN, Power System Operation Corporation (POSOCO) • Flexibility requirements of the Indian power system now and in 5 years
11:20	Showcase **CHINA** By NN, Power System Planning & Research Department, China Electric Power Planning and Engineering Institute (EPPEI) • China's current initiatives and experiences in power plant flexibilisation • Retrofit of hard coal power plants
11:40	Showcase **GERMANY** By NN, Head of Power Plant and Environmental Technologies, VGB • Experience with flexibilisation of Germany's conventional power plants • Role of Biomass
12:00	Q&A with the presenters
12:15	Lunch

Enhancing flexibility of power plants – Part 2

- flexibility of conventional power plants
- technical and regulatory perspective

Moderator: NN, Energinet.dk

13:30	Showcase **DENMARK** By NN, Power Plant Development, ESLAM/DONG Energy • Experience with flexibilisation of Denmark's conventional power plants / CHP
14:00	Showcase **JAPAN** By NN, J-POWER Electric Power Development Co., Ltd. • Requirements for flexibility in the Japanese market • Experience with flexibilization of coal and gas power plants
14:20	Showcase **BRAZIL** By NN, Power Research Company • Flexibility demand and options for Brazil • The role and limitations of hydropower
14:40	Panel Discussion and Q&A with all presenters of Session 1 and 2
15:30	Coffee-break

ADVANCING SYSTEM FLEXIBLITY THROUGH MARKET MECHANISMS

- The role of markets to unlock investments in flexible generation
- Market design options
- Adjustment of market designs

Moderator: Markus Steigenberger, Deputy Director, Agora Energiewende

16:00	Electricity Markets in Transition By NN, Electric Reliability Council of Texas • Integration of high shares of vRES • Security of supply based on market mechanisms
16:20	Designing Markets: The Role of Power Exchange By NN, Position, European Energy Exchange (EEX) • Short term electricity markets • Balancing markets
16:40	Virtual Power Plants: A New Business Model By NN, Next Kraftwerke GmbH • Adaptation of current market design • Price signals for new investments

17:00	Aluminium Electrolysis as Virtual Electricity Storage By NN, Chairman of the Executive Board, TRIMET Aluminium SE • Demand Side from the perspective of an aluminium producer • "Flex-Efficiency"-Study: concept of integration of efficiency and flexibility of industrial consumers
17:20	Panel Discussion / Q&A
Conclusion and Outlook	
17:45	N.N., campaign partners By Simon Müller, Head of Unit System Integration of Variable Renewable Energy, International Energy Agency
18:00	Evening reception for participants

Thursday, 2nd of November		
07:30	Meeting at the hotel lobby after breakfast and Bus transfer to Hohenhameln approx. 270 km (approx. 3h)	
10:30	**Site visit: Mehrum Power Plant** • Hard coal power plant built in 1979. • High increase in efficiency after modernization in 2012. • Used with high flexibility.	 Kraftwerk Mehrum Triftstraße 25 31249 Hohenhameln https://www.kraftwerk-mehrum.de/
12:30	Lunch break and bus transfer back to Berlin	
16:00	**Site visit: Mitte CHP Plant (Berlin-Mitte)** • Efficient power plant (combined cycle) which can utilize up to 90% of the fuel energy. • Main fuel: natural gas. • In operation since 1996.	 Heizkraftwerk Mitte Köpenicker Str. 60 10179 Berlin http://kraftwerke.vattenfall.de/mitte
18:00	Bus transfer back to departure point	

Friday, 3rd of November		
8:30	Meeting at the hotel lobby after breakfast and transfer in delegation bus to field visit.	
10:30	**Site visit: Moabit CHP Plant** • This site is producing electricity since 1900; main fuel: hard coal. • In 1987 some of the historical buildings were torn apart • Retrofitted for co-combustion of biomass in 2013: Natural biomass is directly introduced into the co-combustion process with reasonable technology effort. • Up to 40% of thermal output is generated by biomass.	 Kraftwerk Moabit 13353 Berlin http://powerplants.vattenfall.com/moabit
11:00	Bus transfer to BMWi	
11:30	**Technical presentation: Flexibility options for power plants – the Flexibility Toolbox** *By Tbd, VGB PowerTech*	Federal Ministry for Economic Affairs and Energy BMWi Invalidenstraße 48 10115 Berlin
12:00	**Beyond thermal power plants** **Multi-usage of flexibility options – the "Grid Flex Study"** By Stefan Mischinger, dena	
12:30	**Increasing flexibility by virtual power plants – The example of Statkraft** By Tbd, Statkraft Markets GmbH	
13:00	Lunch break and bus transfer to Neuenhagen near Berlin or alternatively to Energy Brainpool	

15:00	**Site visit: 50Hertz - Transmission Control Centre** • Transmission Control Centre by the transmission grid operator 50Hertz. • Control and regulation of the transmission grid, balancing out variable feed-in of renewables, monitoring of system security.	 50Hertz Transmission Control Centre (TCC) Am Umspannwerk 10 15366 Neuenhagen bei Berlin http://www.50hertz.com/de/
18:00	Bus transfer back to departure point	

Saturday, 4th of November		
9:00 hrs.	Breakfast at hotel	
Morning	For your personal consideration	
Afternoon	Transfer to Airport BER Please provide flight schedule	
	Check-In at International Airport Berlin (BER)	
Night	Arrival in India	

Contact Persons:

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REGISTRATION FORM
Flexibility options to adapt to fluctuating renewable energies
29th October – 4th November, 2017
Leipzig and Berlin, Germany

The Excellence Enhancement Centre (EEC) and the Indo-German Energy Forum (IGEF) Support Office are proud to offer a complete training program with focus on adaptation of thermal power plants to fluctuating renewable energies in Leipzig and Berlin, Germany.

NOTE: **In view of limitations in the size of the delegation, the participation is restricted to one senior official from each organisation**

Please complete the following registration form to guarantee participation.

Data of participant			
Name			
Designation			
Company			
Address:			
Address:			
Address:			
Telephone:			
Mobile:			
WhatsApp Mobile:			
E-Mail:			
Website:			
Passport Number:		Valid until:	
Date of Birth:			
Company ☐	Public Ltd ☐	GOI ☐	Other:
Member of EEC ☐			
Working area of entity			
Interest of participant			
01 Integration of renewables by flexibilisation of power plants			☐
02 Asset optimisation & environmental Protection			☐
03 Storage and e-mobility			☐
04 Legal framework for economic viability of flexible power plants			☐
05 Other:_____			☐
06 Other:_____			☐
07 Other:_____			☐
05 Other:_____			☐
08 Other:_____			☐

What are your expectations in this delegation?

Proposals for further technical visits:

The delegation package includes:

- Briefing of delegation prior to travel
- Assistance in business visa invitation letter from Germany
- Pick up and drop off from airport / hotels (in Germany)
- All transfers in tour bus during the whole training program
- All technical field visits mentioned in the agenda
- Travel insurance for the full travel time as per agenda
- All lunches and dinners as mentioned in the agenda
- Guided city tour through Leipzig and Berlin
- Accompanying bilingual coordinators

The delegation package does not include:

- All transfers in India
- Visa charges
- Flight and hotel
- Other expenses (e.g. handling fees for visa, additional meals, private consumption at the hotel, phone calls, laundry service, personal shopping, others etc.)

Request for registration:

This delegation program is supported by Indo-German Energy Forum (IGEF) support office. We have limited seats, hence we request you to please register latest by the 5th of October, 2017 with the following documents: duly filled, signed and stamped registration form & declaration attached as well as scanned copy of passport.

Any further clarifications please feel free to contact Mr. Jagjit Singh Dua, EEC, duajsingh@yahoo.com , +91-11-26164297-95

Signature of the delegate Date Company Stamp

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(To be signed by the person traveling)

Declaration:

I will not hold EEC/IGEF-SO/GIZ, its affiliates or its executives responsible or liable in case of any injury, loss of property, accident or death arising in the course of the delegation tour in Europe and India.

I will not hold EEC/IGEF-SO/GIZ, its affiliates or its executives responsible or liable for not obtaining the necessary visa for me as this is solely the business of the German Embassy in Delhi or its Consulates General in India. EEC/IGEF-SO/GIZ, its affiliates or its executives are in no way connected to the decision of granting or not granting the required visa.

Signature of the delegate Date Company Stamp

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(To be signed by the person traveling)