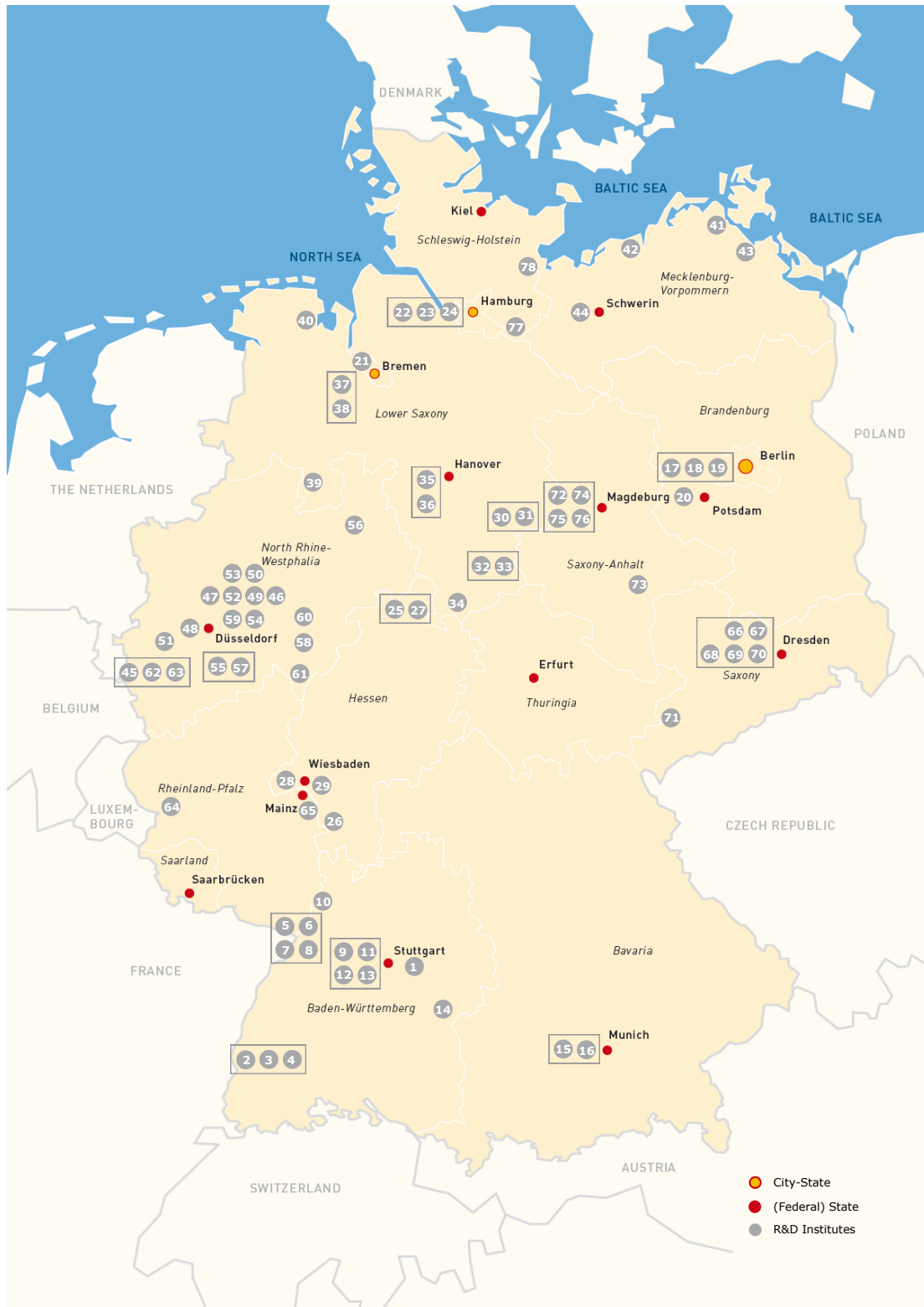


Energy Storage & Fuel Cell Systems

R&D Institutes in Germany (Hydrogen and Fuel Cell Technology)

January 2011



Energy Storage & Fuel Cell Systems

R&D Institutes in Germany (Hydrogen and Fuel Cell Technology)

January 2011

No.	Universities and Institutes	State	City	Core Competence*	Initiative membership
1	University of Esslingen (IBZ)	Baden-Württemberg	Esslingen	b, d	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg FC alliance Baden Württemberg
2	Fraunhofer Institute for Physical Measurement Techniques (IPM)	Baden-Württemberg	Freiburg	i	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg
3	Fraunhofer Institute for Solar Energy Systems (ISE)	Baden-Württemberg	Freiburg	b, e	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg FC alliance Baden Württemberg FC and H₂ network NRW
4	University of Freiburg, IMTEK	Baden-Württemberg	Freiburg	h	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg
5	European Institute for Energy Research (EIFER)	Baden-Württemberg	Karlsruhe	b, c, d, e, h	<ul style="list-style-type: none"> JTI
6	Karlsruhe Institute of Technology (KIT)	Baden-Württemberg	Karlsruhe	e, h, i	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg JTI
7	Fraunhofer Institute for Systems and Innovation Research (ISI)	Baden-Württemberg	Karlsruhe	b	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg FC alliance Baden Württemberg
8	University of Karlsruhe <ul style="list-style-type: none"> Institute of Materials for Electrical Engineering (IWE) 	Baden-Württemberg	Karlsruhe	d, h	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg FC alliance Baden Württemberg
9	German Aerospace Center (DLR) <ul style="list-style-type: none"> Institute of Technical Thermodynamics (Helmholz Association) 	Baden-Württemberg	Stuttgart	b, c, d, e, h, i	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg JTI VDMA FC Working Group
10	Fraunhofer Institute for Chemical Technology (ICT)	Baden-Württemberg	Pfintzal	d, h, i	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg FC alliance Baden Württemberg
11	Fraunhofer Institute for Manufacturing Engineering and Automation (IPA)	Baden-Württemberg	Stuttgart	i	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg
12	University of Stuttgart <ul style="list-style-type: none"> Institute of Chemical Process Engineering Institute of Energy Economics and Rational Use of Energy Institute of Aircraft Design Institute of Plastics Engineering Institute of Physical Chemistry Institute for Space Systems (IRS) Institute of Textile Technology and Process Engineering Institute of Engineering Thermodynamics 	Baden-Württemberg	Stuttgart	a, b, d, e, h, i	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg
13	Centre for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW)	Baden-Württemberg	Stuttgart	b, c, d, i	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg FC alliance Baden Württemberg JTI
14	University of Ulm <ul style="list-style-type: none"> Department of Organic Chemistry III Institute for Surface Chemistry and Catalysis 	Baden-Württemberg	Ulm	d, h	<ul style="list-style-type: none"> FC and battery alliance Baden Württemberg
15	Research Center for Energy industries e.V.	Bavaria	Munich	a, b	<ul style="list-style-type: none"> H₂ initiative Bavaria
16	Technical University of München <ul style="list-style-type: none"> Chair of Energysystems Chair of Thermodynamik Chair of Laser physics and ultra fast processes Chair of Electrical engineering und Information technology 	Bavaria	Munich	b, h	<ul style="list-style-type: none"> H₂ initiative Bavaria
17	University of Berlin (Humboldt) <ul style="list-style-type: none"> Institute of Biology/Microbiology 	Berlin	Berlin	f	<ul style="list-style-type: none"> Element 1
18	Technical University of Berlin <ul style="list-style-type: none"> Department of Energy Systems 	Berlin	Berlin	h	<ul style="list-style-type: none"> Element 1
19	Helmholtz-Center of Berlin for Materials and Energy	Berlin	Berlin	d, h	<ul style="list-style-type: none"> Element 1
20	Leibniz-Institute of Agricultural Engineering Potsdam-Bornim e.V	Brandenburg	Potsdam	f	<ul style="list-style-type: none"> Element 1
21	Fraunhofer Institute for Manufacturing Technology and Advanced Materials (IFAM)	Bremen	Bremen	h, i	<ul style="list-style-type: none"> FC initiative Saxony

* Explanation on page 5

Energy Storage & Fuel Cell Systems

R&D Institutes in Germany (Hydrogen and Fuel Cell Technology)

January 2011

No.	Universities and Institutes	State	City	Core Competence*	Initiative membership
22	University of the German Federal Forces - Helmut Schmidt University	Hamburg	Hamburg	a	• hySOLUTIONS
23	University of Applied Sciences Hamburg (HAW) • Institute of Energy systems and Fuel cell technics	Hamburg	Hamburg	b, c	• FC and H ₂ network NRW • hySOLUTIONS
24	German Aerospace Center (DLR)	Hamburg	Hamburg	b, d, d, e, h, i	• JTI • VDMA FC Working Group
25	Fraunhofer Institute for Wind Energy and Energy System Technology (IWES)	Hesse	Kassel	b	• H ₂ FC initiative Hesse
26	Technical University of Darmstadt	Hesse	Darmstadt	b, i	• H ₂ FC initiative Hesse • FC and H ₂ network NRW
27	University of Kassel	Hesse	Kassel	e	• FC and H ₂ network NRW
28	University of Rhein-Main	Hesse	Wiesbaden	b	• H ₂ FC initiative Hesse
29	University of Applied Sciences Wiesbaden	Hesse	Rüsselsheim	f, g, h	• H ₂ FC initiative Hesse
30	Technical University of Braunschweig	Lower Saxony	Braunschweig	a, b, d, e, i	• FC and eMobility initiative of Lower Saxony
31	Fraunhofer-Institute for Surface Engineering and Thin Films (IST)	Lower Saxony	Braunschweig	h	• FC and eMobility initiative of Lower Saxony
32	CUTEC-Institute GmbH	Lower Saxony	Clausthal	b, c, d, e, i	• FC and eMobility initiative of Lower Saxony • JTI
33	Technical University of Clausthal	Lower Saxony	Clausthal	b, d, h, i	• FC and eMobility initiative of Lower Saxony
34	University of Göttingen - Georg-August	Lower Saxony	Göttingen	I	• FC and eMobility initiative of Lower Saxony
35	University of Hannover	Lower Saxony	Hannover	e, h	• FC and eMobility initiative of Lower Saxony
36	University of Applied Sciences of Hannover	Lower Saxony	Hannover	b, e	• FC and eMobility initiative of Lower Saxony
37	Next Energy	Lower Saxony	Oldenburg	a, b, d, h	• FC and eMobility initiative of Lower Saxony • JTI • VDMA FC Working Group
38	University of Oldenburg - Carl von Ossietzky	Lower Saxony	Oldenburg	b, h	• FC and eMobility initiative of Lower Saxony
39	University of Applied Sciences of Osnabrück	Lower Saxony	Osnabrück	a, b, e	• FC and eMobility initiative of Lower Saxony • FC and H ₂ network NRW
40	University of Applied Sciences of Wilhelmshaven	Lower Saxony	Wilhelmshaven	h, i	• FC and eMobility initiative of Lower Saxony
41	University of Applied Sciences of Stralsund	Mecklenburg-Vorpommern	Stralsund	a, b, f	• H ₂ initiative Mecklenburg-Vorpommern
42	University of Rostock • Institute of Catalysis	Mecklenburg-Vorpommern	Rostock	d, h	• H ₂ Initiative Mecklenburg-Vorpommern
43	Leibniz-Institute of Plasma Research und Technology (INP)	Mecklenburg-Vorpommern	Greifswald	h, i	• H ₂ initiative Mecklenburg-Vorpommern
44	Hydrogen Institute of Applied Sciences (HIAT)	Mecklenburg-Vorpommern	Schwerin	d, h	• H ₂ Initiative Mecklenburg-Vorpommern
45	University of Aachen - RWTH	North Rhine-Westphalia	Aachen	a, b, c, d, e, h	• FC and H ₂ network NRW
46	University of Bochum	North Rhine-Westphalia	Bochum	a, b, c, d, e, h	• FC and H ₂ network NRW
47	Fuel cell research center ZBT (ZBT)	North Rhine-Westphalia	Duisburg	a, b, c, d, e, h	• FC and H ₂ network NRW • JTI
48	University of Düsseldorf - Heinrich Heine	North Rhine-Westphalia	Düsseldorf	d, i	• FC and H ₂ network NRW

* Explanation on page 5

Energy Storage & Fuel Cell Systems

R&D Institutes in Germany (Hydrogen and Fuel Cell Technology)

January 2011

No.	Universities and Institutes	State	City	Core Competence*	Initiative membership
49	University Duisburg-Essen • Faculty of Engineering Sciences	North Rhine-Westphalia	Essen	f	• FC and H ₂ network NRW
50	University of Applied Sciences of Gelsenkirchen - Energy Institute	North Rhine-Westphalia	Gelsenkirchen	b, h, i	• FC and H ₂ network NRW • JTI
51	Institute for Energy Research at Forschungszentrum Jülich (IEF) - (Helmholtz Association)	North Rhine-Westphalia	Jülich	a, b, c, d	• FC and H ₂ network NRW • JTI
52	Max-Planck-Institute for Coal Research (Max-Planck-Institut für Kohlenforschung)	North Rhine-Westphalia	Mühlheim an der Ruhr	h	• FC and H ₂ network NRW
53	The Fraunhofer Institute for Environmental, Safety, and Energy Technology (UMSICHT)	North Rhine-Westphalia	Oberhausen	a, b	• FC and H ₂ network NRW
54	University of Wuppertal	North Rhine-Westphalia	Wuppertal	b	• FC and H ₂ network NRW
55	German Aerospace Center (DLR) • Institute of Technical Thermodynamics	North Rhine-Westphalia	Cologne	a, b, c, d, e, f, h	• FC and H ₂ network NRW • JTI • VDMA FC Working Group
56	University of Applied Sciences Bielefeld	North Rhine-Westphalia	Bielefeld	a	• FC and H ₂ network NRW
57	University of Applied Sciences Köln	North Rhine-Westphalia	Cologne	a, b	• FC and H ₂ network NRW
58	University of Applied Sciences Südwestfalen • Institute of Technology and Knowledge transfer	North Rhine-Westphalia	Iserlohn	a	• FC and H ₂ network NRW
59	Max Planck Institute for Bioinorganic Chemistry	North Rhine-Westphalia	Mühlheim an der Ruhr	f	• FC and H ₂ network NRW
60	Technical University of Dortmund	North Rhine-Westphalia	Dortmund	b, e	• FC and H ₂ network NRW
61	University of Siegen	North Rhine-Westphalia	Siegen	a	• FC and H ₂ network NRW
62	Fraunhofer Institute for Laser Technology (ILT)	North Rhine-Westphalia	Aachen	D	• FC and H ₂ network NRW
63	Fraunhofer Institute for Production Technology (IPT)	North Rhine-Westphalia	Aachen	I	• FC and H ₂ network NRW
64	University of Applied Sciences Trier - Environmental Campus Birkenfeld	Rhineland-Palatinate	Trier	b, d, e	• H ₂ FC initiative Hesse
65	Institute for Microtechnology (IMM)	Rhineland-Palatinate	Mainz	e	• JTI
66	Fraunhofer Institute for Ceramic Technologies and Systems (IKTS)	Saxony	Dresden	c, d, h	• FC initiative Saxony
67	Fraunhofer Institute for Manufacturing Technology & Applied	Saxony	Dresden	h, i	• FC initiative Saxony
68	Fraunhofer Institute for Material and Beam Technology	Saxony	Dresden	h	• FC initiative Saxony
69	Fraunhofer Institute for Transportation and Infrastructure Systems	Saxony	Dresden	a	• FC initiative Saxony
70	Technical University Dresden • Institute of Power Engineering	Saxony	Dresden	a	• VDMA FC Working Group
71	University of Zwickau	Saxony	Zwickau	b, e	• FC initiative Saxony
72	Fraunhofer Institute for Factory Operation and Automation (IFF)	Saxony-Anhalt	Magdeburg	i	• FC alliance Saxony-Anhalt
73	University of Applied Sciences Köthen	Saxony-Anhalt	Köthen	i	• FC alliance Saxony-Anhalt
74	Max Planck Institute for Dynamics of Complex Technical Systems	Saxony-Anhalt	Magdeburg	b, e	• FC alliance Saxony-Anhalt
75	University of Magdeburg - Otto-von-Guericke • Institute of Automation Technology • Institute of Electrical Power Systems • Institute of Process Engineering	Saxony-Anhalt	Magdeburg	b, d, e, h	• FC alliance Saxony-Anhalt
76	University of Magdeburg-Stendal	Saxony-Anhalt	Magdeburg	a, b	• FC alliance Saxony-Anhalt
77	GKSS Research Centre in Geesthacht	Schleswig-Holstein	Geesthacht	h	• JTI
78	University of Applied Sciences Lübeck	Schleswig-Holstein	Lübeck	a, f	• H ₂ initiative Schleswig-Holstein

* Explanation on page 5

Energy Storage & Fuel Cell Systems

Core competences (Hydrogen and Fuel Cell Technology)

January 2011

Core competences	Applications/Component type	Classification
Fuel Cell System integrators	Automobile and buses Materials handling/light duty vehicles Ships Light traction Back-up power and UPS, APU CHP and CCHP, others	a
Fuel Cell System	Automobile and buses Materials handling/light duty vehicles Ships Light traction Back-up power and UPS, APU CHP and CCHP, others	b
Fuel Cell Stack	MCFC SOFC PEMFC DMFC AFC PAFC, others	c
Stack component	MEA Bipolar plates, end plate Separator/gasket Electrode/gas diffusion layer Catalyst Filter, others	d
Balance of plant (BoP)/Electrolyzer/Reformer	Electrolyzers Reformer Pumps/compressors Valves Power inverters, others	e
H2, Biogas and Fuel production technology	Biogas and Biomethan conditioning Biogas plant technology H2 production technology, others	f
Distribution technology	Dispenser and filling technology	g
Storage technology and material	Underground storage Pressure tanks Metal hydrides/nanostructures, others	h
Manufacturing technology	Labs and certification Production plant technology Turn key plant manufacturing technology, others	i

Germany is taking the lead in both technologies, as a market, development platform and export hub. The country is the first choice for companies seeking to enter this developing industry.

Two of the five focal points of the 6th Energy Research Program of the German government starting in 2011 will be energy-storage methods and grid technology, as well as the integration of renewable energies into the energy supply.

Applied research in particular will be ramped up; this in accordance with the objective of modernizing Germany's energy supply in the years ahead. Fuel cell and hydrogen technology joint-funding initiatives have already been operable since 2007 within the framework of the National Innovation Program Hydrogen and Fuel Cell Technology (NIP). Funding of EUR 700 million makes this the biggest R&D and implementation program of its kind in Europe.

Germany Trade & Invest can open up a vista of opportunities for companies looking to cooperate with German partners, to get involved in demonstration projects or to expand through direct investment.

Energy Storage & Fuel Cell Systems

Regional initiatives for Hydrogen and Fuel Cell Technology

January 2011

State	Initiative	Homepage
Baden-Württemberg	FC and battery alliance Baden Württemberg	www.brennstoffzellen-initiative.de
Baden-Württemberg	FC alliance Baden Württemberg	www.bba-bw.de
Bavaria	H ₂ initiative Bavaria	www.wiba.de
Hamburg	H ₂ initiative Hamburg - hySOLUTIONS	www.hysolutions-hamburg.de
Hesse	Initiative for H ₂ and FC Hesse	www.h2bz-hessen.de
Mecklenburg-Vorpommern	H ₂ initiative Mecklenburg-Vorpommern	www.wti-mv.de
Lower Saxony	FC and eMobility initiative of Lower Saxony	www.brennstoffzelle-nds.de
North Rhine-Westphalia	FC and H ₂ network NRW	www.brennstoffzelle-nrw.de
Rhineland-Palatinate	Future technologie network Rhineland-Palatinate	Kompetenznetzwerk Zukunftstechnologie Brennstoffzelle Rheinland-Pfalz *
Saarland	Institute for energy systems in the future	www.izes.de
Saxony	FC initiative Saxony	www.bz-sachsen.de
Saxony-Anhalt	FC alliance Saxony-Anhalt	www.brennstoffzelle-sa.de
Schleswig-Holstein	H ₂ initiative Schleswig-Holstein	www.s-h2.de
Berlin	FC and H ₂ network Berlin-Brandenburg	www.element-1.org
Brandenburg	FC and H ₂ network Berlin-Brandenburg	www.element-1.org

* No homepage

Our services

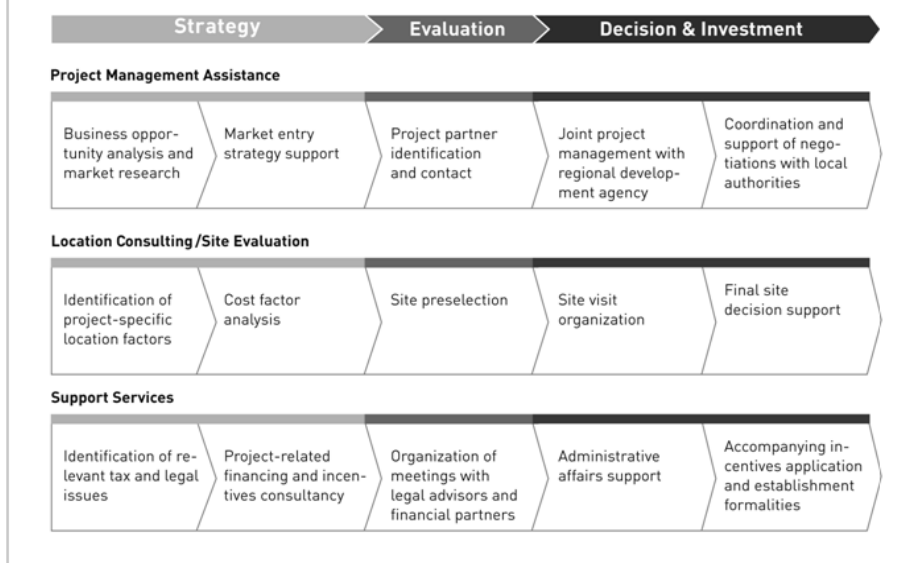
- Market research
- Competitive analysis
- Legal information
- Site selection support
- Financing and incentive consultancy
- Project management

About Us

Germany Trade & Invest is the economic development agency of the Federal Republic of Germany. Our team of industry experts supports international companies from market entry to business start-up in Germany.

We want to make sure you make the right location decision. That's why we organize on-site visits and fact-finding missions in one of Europe's most attractive investment locations. We are also there to help you find the right local partners.

Our Services for Direct Inward Investments



All inquiries relating to Germany as a business and investment location are treated confidentially. Our investment services are provided entirely free of charge.

© Germany Trade & Invest, January 2011.

All market data provided is based on the most current market information available at the time of publication. Germany Trade & Invest accepts no liability for the actuality, accuracy, or completeness of the information provided.

For Further Information

Germany Trade & Invest GmbH
 Friedrichstraße 60
 10117 Berlin
 Germany
 T. +49 30 200 099-555
 F. +49 30 200 099-999
 energystorage@gtai.com
 www.gtai.com/energystorage

