Deutsche Gesellschaft für
Technische Zusammenarbeit
(GTZ) GmbH

# The Feed-in-Law of Germany

# 德国可再生能源电力上网法

**Frank Haugwitz** 韩 飞

International Conference on Recent
Renewable Policy Development

可再生能源政策近期进展国际会议

July 25-26, 2002 Beijing

北京, **2002**年**7**月**25-26**日

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# Structure of Presentation

## 报告结构

- Act on Feeding into the Grid Electricity Generated from RE-Sources
  可再生能源电力上网法
- RE-Sources Act 可再生能源法
  Purpose, Scope, Obligations, Feed-in-Tariffs, Common Provisions, Grid Costs, Nation-wide Equalisation, Reporting
  目的, 范围, 义务, 上网电价, 通用措施, 电网费用, 全国平衡, 报告制度
- Supporting Policies 鼓励政策
- Achievements 成就
- Outlook 展望

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

- The German Act on Feeding into the Grid Electricity from RE-Sources was effective from January 1, 1991 until the end of 1999

  德国可再生能源电力上网法自**1991**年**1**月**1**日生效, 截止到**1999**年底

- On April 1, 2000 the German Act on Granting Priority to Renewable Energy Sources hereinafter the Renewable Energy Sources Act came into effect

  **2000**年**4**月**1**日, 德国优先采用可再生能源法生效, 在此称为可再生能源法

- Why needed an existing law to be replaced?

  为什么有必要替代原有法律**?**

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# SHORTCOMINGS OF THE LAW 该法律的不足

- Tariffs for other RE-Sources than wind, were not sufficient to stimulate their large-scale market introduction 对风能以外的其它可再生能源规定的电价不足以刺激其大规模进入市场
- Didn't stipulate degressive and differentiating tariffs which reflects e.g. technological innovations 没有针对诸如技术进步等对电价的递减和区别对待作出规定
- No regulations regarding costs for grid connections, extensions, and enforcement

  没有电网接入费和电网增容费的相关规定，也没有相应的协调部门和法律条款

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# SHORTCOMINGS OF THE LAW 该法律的不足

- RE-Tariffs were linked to average electricity tariffs, but the liberalisation of the German electricity market 1998 led drop these tariffs and threatened the planning and investment security, therefore a new approach was necessary, i.e. clearly fixed tariffs which as well reflects the actual costs of the various RE-Technologies

  可再生能源电价与平均电价挂钩, 而**1998**年德国电力市场开放导致电价下降, 威胁规划和投资安全, 因此有必要实施新办法, 例如制定明确的固定电价，它们应该能够确实反应各种可再生能源的技术成本。

- The green electricity output exceeded the 5% ceiling previously set for entitlement 绿色电力的发电量已经超过以前规定的**5%**的优惠上限

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 1 PURPOSE OF THIS ACT 目的

- To facilitate a sustainable development of energy supply in the interest of tackling global warming and protecting the environment
  施行可持续发展的能源供给，以应对全球气候变暖和保护环境
- To achieve a substantial increase in the percentage of RE-Sources to power supply
  大幅度提高可再生能源电力供给份额
- To double the share of RE-Sources in total energy consumption by 2010, i.e. 12,5%
  到**2010**年实现可再生能源占总能源消费份额翻番, 达到**12.5%**。

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 2 SCOPE OF APPLICATION 应用范围

- Solar, Hydro, Landfill Gas / Biogas up to 5 MW

  功率至**5MW**的太阳能,水电,固体填埋物沼气以及生物沼气装置

- Biomass up to 20 MW, Wind/Geothermal unlimited

  生物质能至**20MW,** 风能和地热能无容量限制

- Utility companies which operates grids for public power supply (grid operators) will be reimbursed

  经营公共电网的电力公司**(**电网营运商**)**将得到补偿

- New installations after, and existing installations commissioned prior to the Act. Reactivated or modernised installations

  适用于法案生效后新投运的设施以及生效前已有的设施对于重新投运的或经现代化改造的设施, 如果投资至少超过相应新建电站的**50%,** 法案也适用

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 3 OBLIGATIONS 义务

- Grid operators are obliged to purchase electricity generated from renewable sources and to compensate the suppliers of this electricity
  电网营运商有义务购买可再生能源电力，并对电力供应者予以补偿
- Assuming the grid is technically suitable, the obligation applies to the grid operator whose grid is closest to the location of the electricity generation installation 如果电网在技术上适合，这一义务适用于距离发电装置最近的电网营运商
- If this is requested by the party interested in feeding in electricity, the grid operator is obliged to upgrade its grid without delay at reasonable economic expense in order to provide a technically suitable grid 如果对电力上网感兴趣方有要求，则电网营运商有义务以合理的费用及时将电网升级，以提供技术上合适的电网

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 7 FEED-IN-TARIFFS FOR WIND 风力发电上网电价

- Five years for all sites at least 0,09 € /kWh
  五年期内对于所有风电场, 电价至少为**0.09 € /kWh**
- Thereafter, depending on the wind regime of the site, the tariff will be reduced, i.e. at coastal sites the lowest possible tariff is 0,06 € /kWh whereas at mainland sites tariffs remains up to 0,08 € /kWh
  然后, 根据风场的风力情况降低电价。沿海风场可能的最低电价为**0.06 € /kWh**, 内陆风场维持在不超过**0.08 € /kWh**
- Off-Shore installations built by the year 2006 receive nine years at least 0,09 € /kWh
  **2006**年以前建设的海上风力发电设施在**9**年之内至少获得**0.09 € /kWh**的电价
- As of January 1, 2002, for new installations commissioned as of this date the tariffs will be reduced by 1,5% annually 从**2002**年**1**月**1**日开始新投运装置的电价将逐年减少**1.5%**

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 8 FEED-IN-TARIFFS FOR PV 太阳能发电上网电价

- Existing and new installations: 0,52 € /kWh
  现有设备以及新设备的电价: **0.52 € /kWh**
- As of January 1, 2002, a reduction of 5% and by another 5% each subsequent year came into effect 从**2002**年**1**月**1**日开始逐年降低**5%**
- At the end of June, 2002, the German Bundestag amended the Act with respect to raise the former upper ceiling from 350 MW to 1GW. Otherwise, by 2003 no further PV-Installations would have been subject to entitlement **2002**年**6**月底, 德国国会修订了该法案, 将上限从**350MW**提高到**1GW**。否则, 从**2003**年开始太阳能发电装置将不再能够享受优惠政策。

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 9 COMMON PROVISONS 通用措施

- The Feed-in-Tariffs are to be paid for a period of 20 years after the year of commissioning, except for hydro power it is unlimited, due to longer amortisation periods

  在电厂投运后的**20**年期间支付有优惠的上网电价。水电则没有时间限制，因为其折旧期很长。
- Regarding installations which were commissioned before the Act came into effect, the year 2000 is considered to be the year of commissioning

  对于法案生效之前投运的装置，以**2000**年作为其投运的年度

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 10 GRID COSTS 电网费用

- Costs associated with connecting installations to the most technically and economically grid shall be borne by the installation operator
  与最经济、技术最合理的电网的接入费用应该由发电装置的经营者承担
- Costs associated with upgrading and / or expanding the grid shall be borne by the grid operator 电网升级或扩建的费用应该由电网经营者承担
- Any disputes shall be settled by a clearing centre
  任何分歧由一个调解中心负责解决

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 11 NATION-WIDE EQUALISATON 全国平衡

- Transmission grid operators are obliged to record the amount of energy purchased and compensations made and to equalise them among themselves

  输电网经营单位有义务记录他们的购电量和所作出的补偿, 并在输电网经营单位之间自行进行平衡

- All utility companies which deliver electricity to final consumers must purchase nationally uniform quotas of generated electricity from RE-Sources and pay compensation to the transmission grid operators

  所有对最终用户供电的电力公司都应按照全国统一的配额购买可再生能源电力, 并对输电网营运商支付补偿

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# § 12 PROGRESS REPORT 进展报告

- Relevant Ministries have to submit every two years a report covering the progress achieved in terms of the market introduction and cost development of power generation installations
  联邦相关的各部要每两年提交一份进展报告，总结发电装置在进入市场和费用变化等方面的情况
- Furthermore, the report, where necessary, propose adjustments of the tariffs and their reduction rates, taking into account e.g. technological innovations
  如果有必要的话，进展报告可以在考虑新设施的技术进步以及市场的发展情况下，提出电价修正以及电价降低率的建议

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# SUPPORTING POLICIES 鼓励政策

- Amendments to the federal building code in 1997 simplified the permitting process with regard to the installations of new wind turbines, i.e. wind parks were given the same status as traditional power plants
  **1997**年对联邦建筑法规的修订简化了新建风力透平装置的审批程序，将风电场和传统电站给予了相同的处理
- Investment funds marketed to private investors offers the opportunity to shelter income tax liabilities 参加个人投资基金的个人投资者可以享受一定的个人所得税优惠
- Aid was provided through investment grants and soft loans
  在开放式优惠贷款和专项优惠贷款方面提供帮助

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# GENERAL ACHIEVEMENTS 总体成就

- Through RE approx. 35-40 Mio. t $CO_2$ less emitted
  由于可再生能源的利用, 减少约**3500-4000**万吨**$CO_2$**排放
- By the end of 2002, almost 8% of nation-wide consumed electricity will come from RE-Sources
  到**2002**年底, 全国电力消费接近**8%**来自可再生能源
- RE created 100.000 jobs, wind sector alone 35.000
  可再生能源产业创造了**10**万个就业机会, 仅风能就**3.5**万个

Deutsche Gesellschaft für
Technische Zusammenarbeit
(GTZ) GmbH

# ACHIEVEMENTS WIND / PV

## 风能和太阳能发电的成就

- By July 2002, approx. 10 GW wind power capacity and approx. 200 MW PV were installed
  到**2002**年**7**月**,** 风电和太阳能发电的装机容量分别达到约**10GW**和**200MW**
- Cost reductions of wind power turbines by 50% compared to the level of 1990
  与**1990**年相比**,** 风力发电机制造成本降低了**50%**
- In recent years PV production costs dropped substantially
  近年来太阳能发电装置制造成本显著下降
- Wafer and Solar cells production capacities demonstrates rapid expansion rates
  压制晶片和普通太阳能电池制造能力迅速增长

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

# OUTLOOK 展望

- By 2003 wind will very likely replace hydro power as the leading renewable source in terms of generated electricity 从**2003**年开始, 风能发电量很有可能取代水电，在可再生能源中占主导地位
- By 2007/2010 approx. 3,5 GW Off-Shore wind turbines will be installed and by 2030 approx. 25-30 GW 在**2007-2010**年期间将有约**3.5GW**的海上风力发电装机, 到**2030**年约**25-30GW**
- By 2003, per year 80-100 MW PV will be installed 从**2003**年开始, 每年太阳能发电装机约达**80-100MW**
- By 2005 PV-Production capacity will have been threefold, i.e. wafers 320 MW and solar cells 256 MW respectively
  到**2005**年, 太阳能发电容量将增至**3**倍, 即压制晶片电池**320MW**, 普通太阳能电池**256MW**

Deutsche Gesellschaft für
Technische Zusammenarbeit
(GTZ) GmbH

# Thank you for your attention!

谢　谢!