LEAP to Net Zero - The Viessmann Climate Strategy - experiences and learnings for energy efficiency and climate action networks

LEAP to Net Zero——菲斯曼公司能效和气候行动网络的策略、经验和教训

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安德烈亚斯·韦德，可持续发展部门主管，菲斯曼气候解决方案公司

A climate solutions company since 105 years
一家有105年历史的气候解决方案公司

Viessmann at a glance 菲斯曼公司简介

A family company with long term focus

- 4th generation of the founding family
- 13,000 family members across the globe
- More than 175,000 partners and installers

一家注重长远发展的家族企业
- 创始家族的第四代
- 全球遍布一万三千多个家族成员
- 超过十七万五千个合作伙伴和安装技术人员

An enabler of a just energy transition

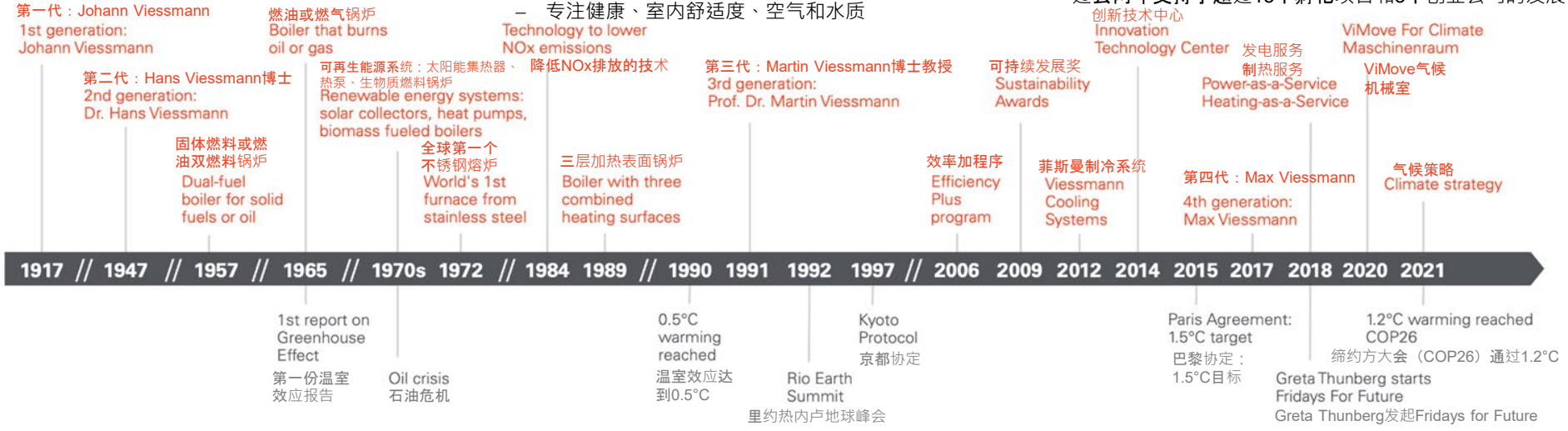
- 5% of annual revenue invested in research and development
- Energy efficient offerings for all energy sources and every household income level
- A market leader in heat pumps and hydrogen-ready solutions
- A focus on health, indoor comfort, air and water quality

能源转型的促成者
- 将年收益的5%投入到研发
- 给各能源种类和各收入水平的家庭提供能效方案
- 在热泵和氢落地方案领域的市场引领者
- 专注健康、室内舒适度、空气和水质

A living purpose

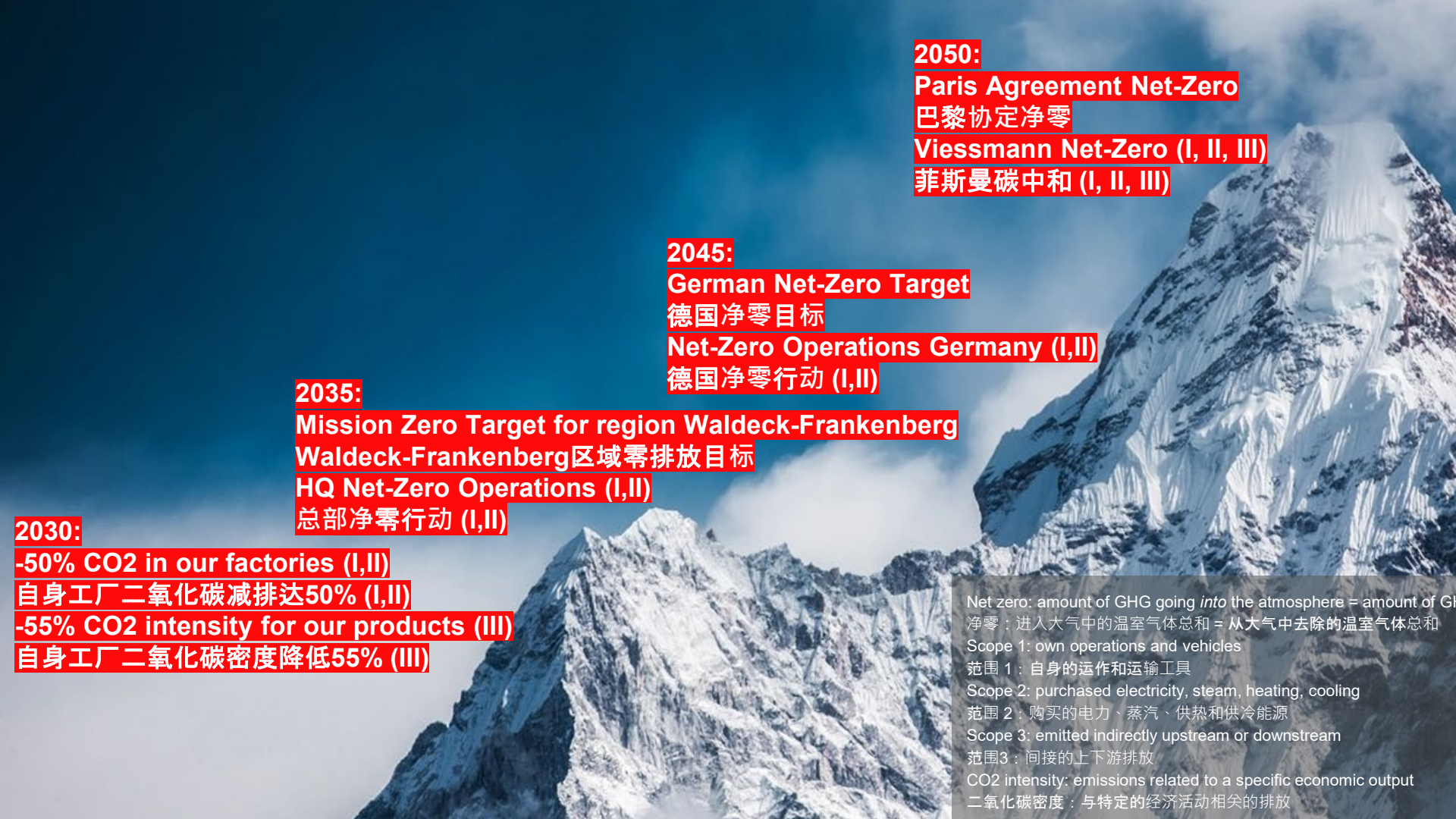
- 95% green electricity use in Germany
- 50% decrease of own absolute CO_2 emissions versus 2005
- 33% renewable energy in total energy consumption
- 15+ incubation projects and 3 start-up ventures supported over the past 2 years

我们的使命
- 德国绿电利用率达95%
- 自身的二氧化碳排放相对2005年水平降低50%
- 可再生能源占总耗能的33%
- 过去两年支持了超过15个孵化项目和3个创业公司的发展



Principles 原则

1. We are **aligned with climate science** (1.5C)
   我们和**气候科学**（1.5C）**保持一致**
2. We defined a **global strategy** for the whole group
   我们为整个集团定义了一个**全球战略**
3. We address the **whole value chain**
   我们考虑**整个产业链**
4. We foster a **systems transformation** beyond our own operations
   我们促进超越自身企业的**系统转型**


2050:
Paris Agreement Net-Zero
巴黎协定净零
Viessmann Net-Zero (I, II, III)
菲斯曼碳中和 (I, II, III)
2045:
German Net-Zero Target
德国净零目标
Net-Zero Operations Germany (I,II)
德国净零行动 (I,II)
2035:
Mission Zero Target for region Waldeck-Frankenberg
Waldeck-Frankenberg区域零排放目标
HQ Net-Zero Operations (I,II)
总部净零行动 (I,II)
2030:
-50% CO2 in our factories (I,II)
自身工厂二氧化碳减排达50% (I,II)
-55% CO2 intensity for our products (III)
自身工厂二氧化碳密度降低55% (III)
Net zero: amount of GHG going *into* the atmosphere = amount of GH
净零：进入大气中的温室气体总和 = 从大气中去除的温室气体总和
Scope 1: own operations and vehicles
范围 1：自身的运作和运输工具
Scope 2: purchased electricity, steam, heating, cooling
范围 2：购买的电力、蒸汽、供热和供冷能源
Scope 3: emitted indirectly upstream or downstream
范围3：间接的上下游排放
CO2 intensity: emissions related to a specific economic output
二氧化碳密度：与特定的经济活动相关的排放

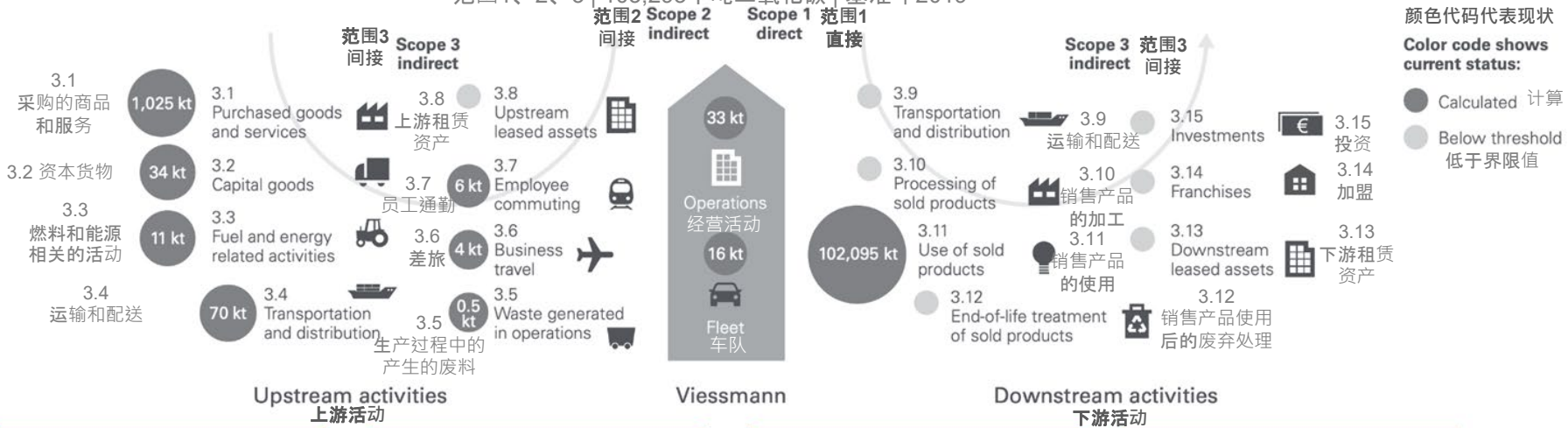
We leap to net zero
We lead
We empower
We advocate
We partner
我们跃向净零
我们引领
我们鼓励
我们主张
我们合作

菲斯曼公司的碳排放

Viessmann corporate carbon emissions[4]

Scope 1, 2, 3 | 103,293 kt CO_2e | Base year 2019

范围1、2、3 | 103,293千吨二氧化碳 | 基准年2019



Total Scope 3 indirect upstream emissions: 1,150 kt (1.11%)

范围3合计间接上游排放：1,150千吨（1.11%）

Total Scope 2 indirect upstream emissions: 6.9 kt (00.1%)

范围2合计间接上游排放：6.9千吨（0.1%）

Total Scope 1 direct emissions: 41.5 kt (0.04%)

范围1直接排放：41.5千吨（0.04%）

Total Scope 3 indirect downstream emissions: 102,095 kt (98.84%)

范围3合计间接下游排放：102,095千吨（98.84%）

Viessmann Climate Strategy 菲斯曼的气候战略

In anutshell简而言之

Our climate strategy “**LEAP to Net Zero”**. It builds upon four pillars: **L**ead, **E**mpower, **A**dvocate and **P**artner - “**LEAP**”. We want to make a leapfrog, in other words a giant step forward towards net zero of our **own operations** and the **systems** that we are part of.

我们的气候战略 “**LEAP to Net Zero”**（跃向净零）是建立在四个核心**之上**：**L-**引领、**E-鼓励、A-主**张和**P-合作**。**我**们希望能实现超越，换**句**话说向我们**自身经营活动和我**们所在的**系统**实现净零跃进一大步。

Our climate strategy visual shows that all four strategic pillars are connected to our company’s **purpose.** This is because our **purpose has guided** our **strategy** formulation and vice versa, our **strategy** enables us to **live up** to our **purpose**.

我们的气候战略视图展示了四个战略核心是和我们的企业使命紧紧相连的。因为我们的使命引导着我们战略的制定，反之，我们的战略造**使我**们无愧于我们的使命。

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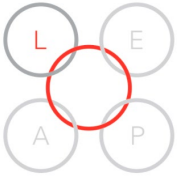
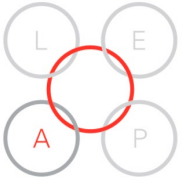
Viessmann Climate Strategy 菲斯曼气候战略

We lead, empower, advocate and partner 我们引领、鼓励、主张和合作 to do our part for climate change 为气候变化尽我们的一份力

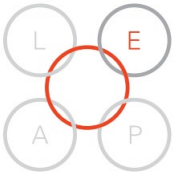
Strategic Pillars of “LEAP to Net Zero” 跃向净零的战略核心



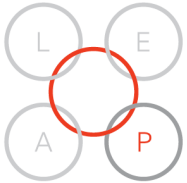
We **lead** by example.
Our operations will be net zero, regenerative, circular and embedded in healthy ecosystems.
我们以身作则引领大家。
我们的经营活动将会达到零排放、可再生的、循环的、嵌入到健康的生态系统。



We **advocate** to foster a movement.
Employees and partners will be climate heroes. Our brand will be the trusted partner for climate action. We will be the thought leader for climate policies.
我们主张促进进步。
员工和合作伙伴将会成为气候英雄。我们的品牌将成为可信赖的气候行动的伙伴。我们将成为气候政策的思想引领者。



We **empower** people to act.
People will be empowered to radically reduce their CO2 emissions and be prosumers - through our many climate solutions.
我们鼓励大家去行动。
大家将会被鼓励去合理的利用我们提供的气候方案降低他们的二氧化碳排放并成为产消者。



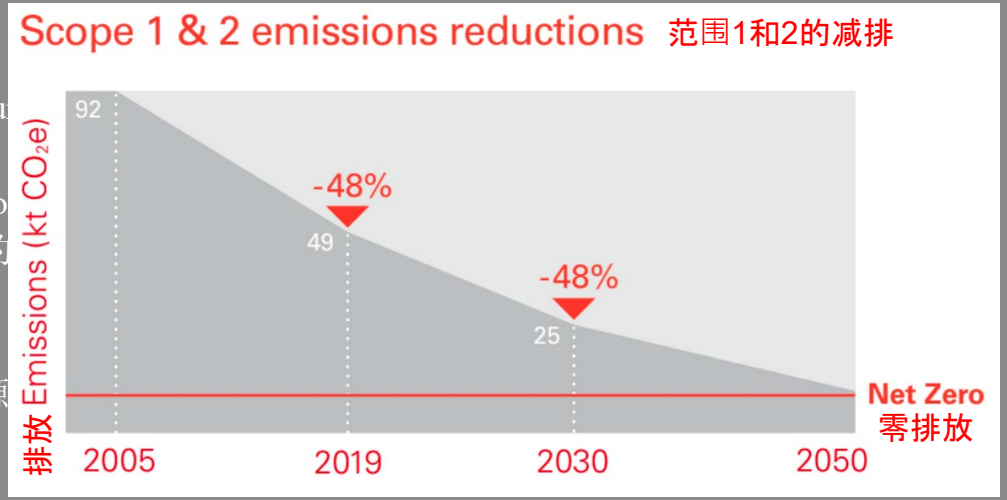
We **partner** to scale impact.
Suppliers and partners will be empowered to radically reduce their CO2 emissions. The region around our headquarters will be net zero. Our venturing and innovation activities will contribute to net zero.
我们合作扩大影响。
供应商和合作伙伴将会被鼓励合理的去降低他们的二氧化碳排放。在我们总部附近的地区将会实现零排放。我们的企业和创新的活动将会对零排放做贡献。

Example #1ViSustain
案例一：ViSustain

Climate Target for our own operations (Scope 1,2)
我们自身经营活动的气候目标（范围1、2）

Public commitment in Climate Report to invest more than €60 million over the next 10 years in the following measures:
公开在气候报告中承诺在未来10年投资超过六千万欧元到以下措施：

1. continue the shift to renewable energy sources for our operations 继续提高可再生能源占比
2. further improve the energy efficiency of our production equipment and waste heat recovery 继续提高我们的生产设备的能效和废热利用率
3. continue the shift towards renewably powered e-mobility in our company car fleet 继续提高清洁能源汽车在我们企业车队的占比
4. new factories will be developed and built carbon neutral 新工厂的发展和建造将会向碳中和方向发展



Roll-out of investment plan for first factories in 2022 defined.
详尽的针对第一批工厂的投资计划将在2022年落实。

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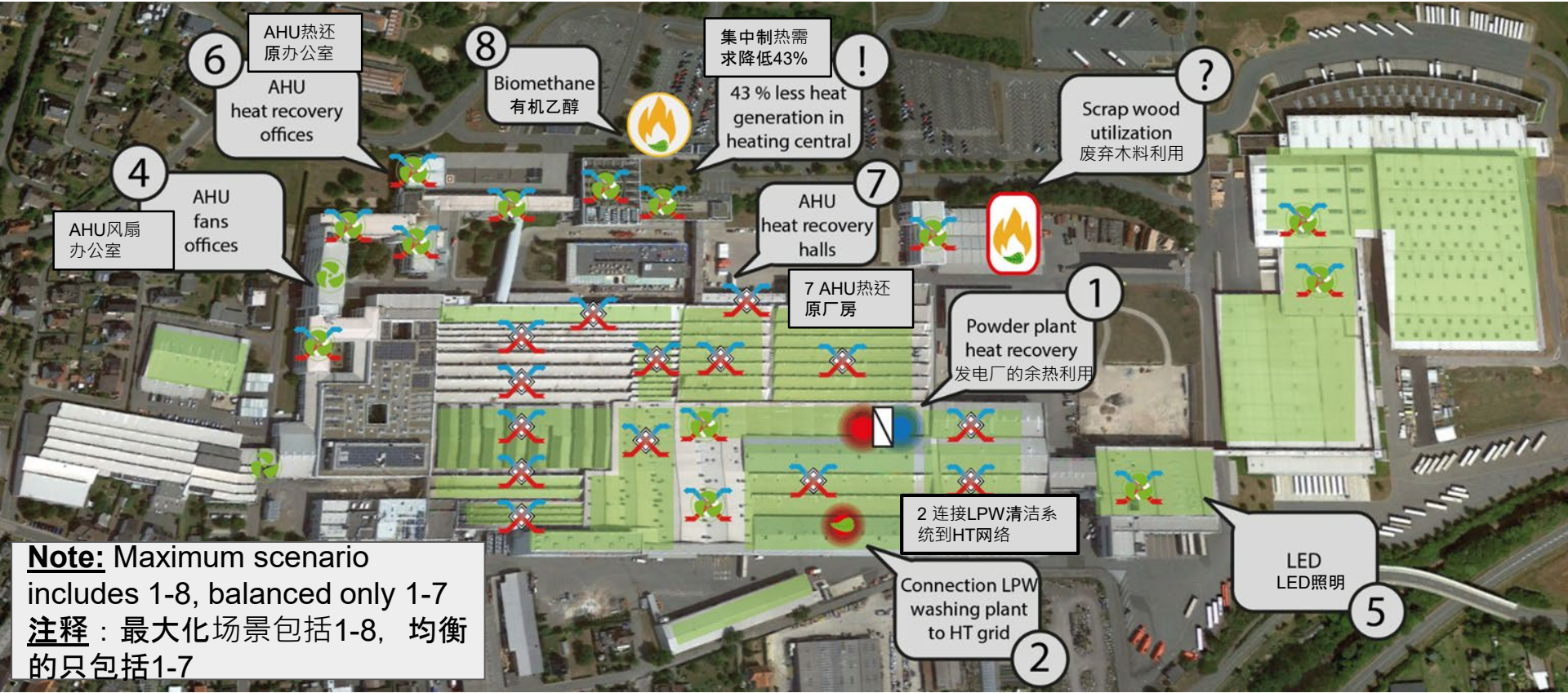
Maximum scenario HQ operations: The measures touch upon different areas

总部经营活动的最大化场景：措施涉及各个领域

Visualization of measures across VWA site - numbers indicate sequence of implementation

VWA场地的措施计划示意图 – **数字代表措施**应用的顺序



Note: Maximum scenario includes 1-8, balanced only 1-7

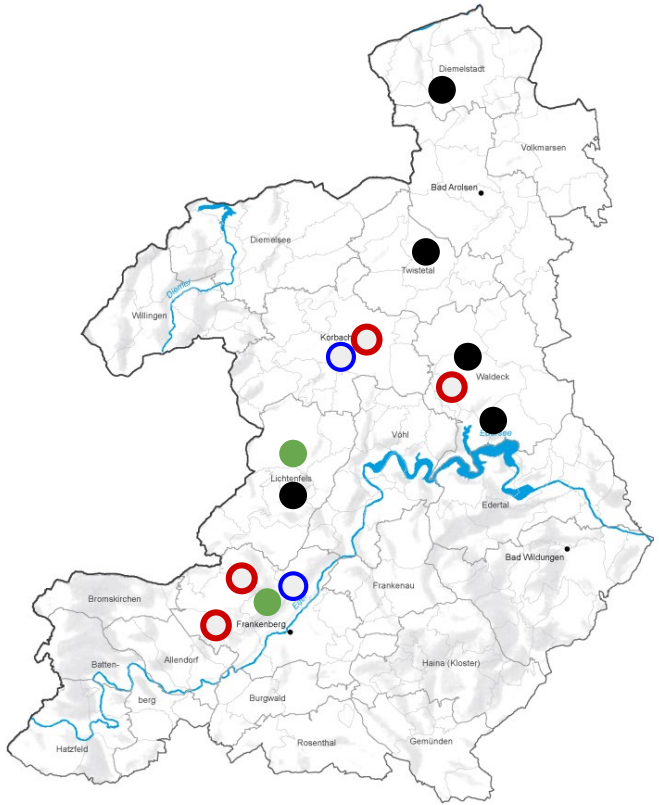
注释：最大化场景包括1-8，均衡的只包括1-7

Example #2: Mission Zero
案例二：零排放目标

Klimaneutrales
Waldeck-Frankenberg
气候中和的
Waldeck-Frankenberg
Für eine lebenswerte Region 一个生机勃勃区域
#missionzero 零排放目标

Project landscape (evolving) 项目地图（发展中）

Projects will be portrayed, savings and best practices communicated and shared.
项目将会被描绘和记录、节能和最佳实例会被沟通和分享。



Keine Detailabbildung

- Hydrogen pilots 氢能示例项目
- Forestry projects 林业项目
- Lighthouse projects 灯塔项目
- New real estate development projects 新的房地产开发项目

Klimaneutrales Waldeck-Frankenberg

Pick & choose offerings of the network initiative 挑选新的加入网络的成员

Expert workshops 专家研讨会

Discussions 讨论
On specific areas (i.e. buildings) - within expert groups and introduced through subject matter experts to facilitate exchange and collaboration .
在特殊领域（如建筑）与之相关的专家会被介绍进来进行交流和合作。

Presentations 展示
Input presentations by experts to the network on specific topics (i.e. hydrogen).
专家向网络的成员进行相应主题的内容展示（如氢能）。

Climate workshops 气候研讨会
Operational development and execution of joint climate strategies - accompanied by subject matter experts.
经营活动的发展和合作气候战略的落实 – 邀请主题相关的专家参与。

Networking events 社交活动

Member meetings 成员会议
Regular status updates on the developments within the initiative.
成员间对发展的常规报告。

Best -practice knowledge sharing 最佳案例的分享
Presentation of implemented projects and CO2 reductions by member organizations, to share best practices & lessons learned.
成员组织对已落实的项目或减排成功进行展示、分享最佳案例和吸取的经验、教训。

Partnerships 合作关系

The regional initiative is embedded in pan-regional and national networks through partnerships.
由于合作关系，同区域的成员将被嵌入到区域和全国的网络。

Examples/案例:

- Maschinenraum 机械房
- Energy Agency of Hesse 黑森州能源机构
- Klimabonus e.V. 气候补贴联盟
- Covenant of Mayors 市长联盟
- University partnerships 大学合作
- Efficiency networks 能效网络
- Energy optimization consultancy 能源优化咨询公司
- ProjectTogether 项目合作

Individual support 个别支持

Initial evaluation & consulting 初步评估和咨询
Experts from the membership - “climate ambassadors”- offer initial expertise and assessment on reduction and savings potentials.
成员中的专家-“气候大使”-提供对减排和节能潜力的初步意见和评估。

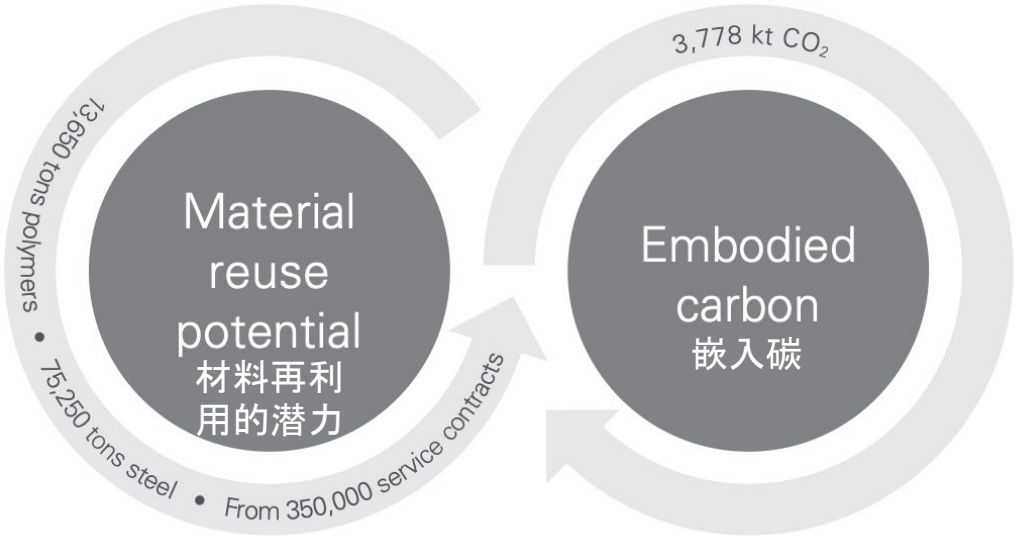
Balancing support and consultancy 平衡支持和咨询
Holistic approach on climate accounting is offered to members of the network initiative to establish baseline.
为成员提供全面的气候清算，借此为加入网络的成员建立一个基准线。

Example #3: Value Added Services & Demand Side Management
案例三：附加价值服务和需求侧管理

Heating as-a-service 供热服务

保留原材料并将碳嵌入到循环中

Keeping raw materials and embodied carbon in the loop[6]



13,650吨聚合物 · 75,250吨钢 · 整合自350,000份 服务合同

Example calculation for assuming a typical heat pump system for individual households like the Vitocal-200s (5kW) with indoor and outdoor unit, as well as warm water storage, ie. Vitocell 100E, with the following material composition: Heat pump (IDU + ODU): 135 kg steel, 20 kg insulation material / warm water storage tank: 80 kg steel, 19 kg insulation material. Embodied carbon potential (reference unit process data* from oekobaudat LCA database, available here https://www.oekobaudat.de/en.html)* Steel embodied carbon = 3.6 kg CO2e / kg steel and *EPDM foam for boiler, water tank insulation embodied carbon = 256 kg CO2e / kg EPDM foam

The dematerialization of climate solutions will be an enabler of increasingly circular material flows as we move towards the sale of comfort, e.g. indoor temperature or air quality, instead of hardware.
由于我们正从销售硬件过渡到舒适的时代，如室内温度或空气质量，非物质化的气候方案将会是材料循环推动者。

That way, the physical system remains part of a controlled cycle and the system components can be reused and recycled as technical nutrients in our operations. Already today, thousands of households in Europe are using our heating service.
由此，部分物理系统保留不变，而系统组成部分则作为我们的经营运作的重要技术可被再利用或回收。至今，欧洲已有千家万户在用我们的供热服务。

Looking ahead, market research suggests that the willingness to switch to service based heating contracts will be at 10%of the heating market by 2030.
展望未来，市场调查透露出10%的供热市场在2030年前倾向于转型到服务为基础的供热合同。

Forecast of heat pump operation
热泵运作预测

Viessmann (Yesterday 14:30)/菲斯曼 （昨天14:30）
Hey👋, tomorrow at 7:00, our heat pumps are going to consume 1 MW, but if you need we can go down to 500 kW
你好👋，明天7点我们的热泵将会需要1兆瓦，但是如果你有需要我们可以降低到500千瓦

TSO (6:00)/输电商（6：00）
Nice, the grid is a bit busy at that time, but I'm not gonna need all of that. Why don't you just do 700 kW?
好的，那个点电网一般需求比较大，不过我也不会需要用到全部。要么你调到700千瓦？

Control heat pumps (& update forecast)
热泵调控（并更新预测）

Viessmann (6:01)/菲斯曼（6:01）
No worries, I can definitely do that. Btw, that means my consumption at 7:00 will be 700 kW and I can't provide any more flex for the next 2 hours. You know, people want to take hot showers ☺
这个我这边完全没问题。对了，那我这边7点就占用700千瓦，然后我接下来的俩小时也不能提供灵活性。你懂的，大家都想洗个热水澡☺

Measure actual consumption
测量真实能耗

TSO (6:01)/输电商（6：01）
Awesome! Thanks 👍
Oh, don't forget to tell me what was the actual consumption of the heat pumps
好的！谢谢👍
对了，到时候别忘了告诉我热泵实际消耗了多少

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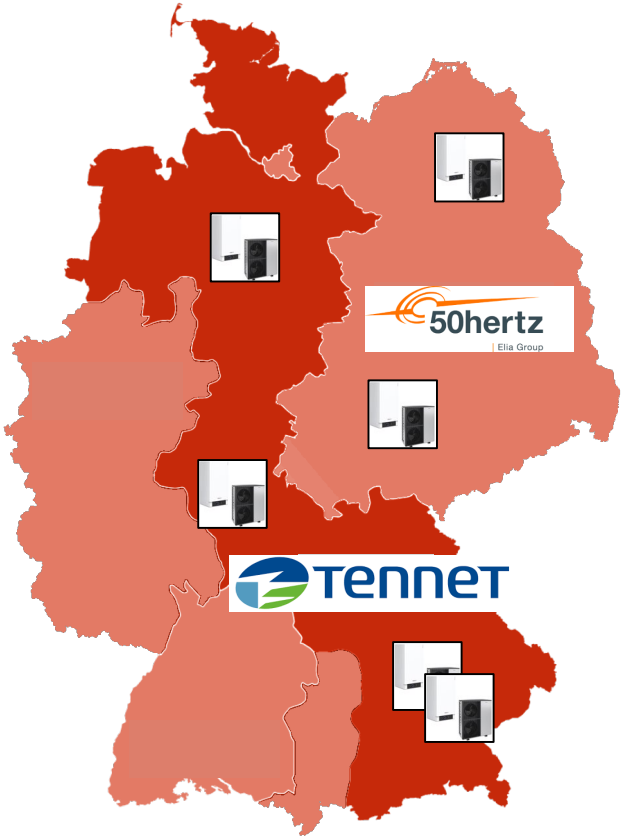
Cooperation with TSOs 和输电商的合作

Load management for transmission systems
输电系统的负荷管理

- Viessmann pools the heat pumps of all ViFlex customers per grid node of the TSO. 菲斯曼集中调控输电网接口所有ViFlex客户的热泵。
- All communication via the multi-TSO platform **Equigy** (“Crowd Balancing Platform” CBP) 所有沟通都在多输电商共用平台**Equigy**（多用户平衡平台CBP）



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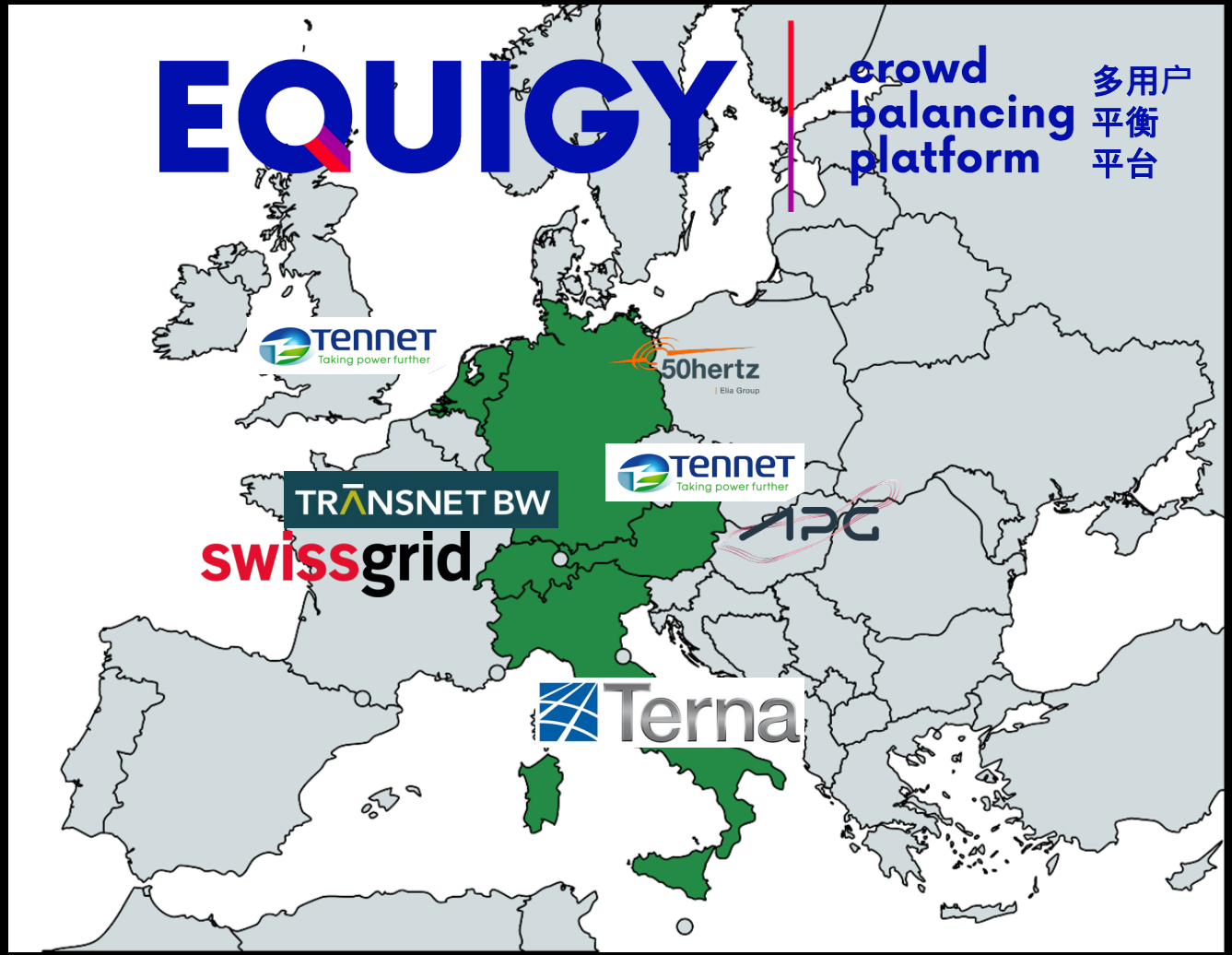
EQUIGY
crowd
balancing
platform
多用户
平衡
平台
TenneT
Taking power further
50hertz
Elia Group
TenneT
Taking power further
TRANSNET BW
swissgrid
Terna

Some elements on the German situation 德国国情因素

Market design barriers 市场设计障碍

- Share of wholesale market price component in end electricity price is still low 批发电价在终端电价占比仍很低
- Ancillary services: assets still cannot be aggregated across multiple TSO areas 辅助服务：资产仍无法整合到涉及多输电商领域
- DSF is excluded from some markets, e.g. the Strategic Capacity Reserve is in practice only accessible to power plants 个别市场不包括需求侧灵活性，比如策略性备用容量实际上只提供给发电厂
- C&I customers are incentivised to maintain a stable load profile to avoid high grid charges (7000h-rule), instead of engaging in flexibility 鼓励商业和工业用户保持稳定的能耗曲线以避免电网费用过高（七千小时原则），而不是推动灵活性
- The slow smart meter rollout limits the number of residential customers that can take advantage of DSF propositions 缓慢的智能电表发展限制了可受益于需求侧灵活性的住宅用户数量
- DSOs are given direct access to low-voltage connected flexibility rather than a market led approach (§14a EnWG, Redispatch 2.0) 配电商可直接调度低压电网提供的灵活性而不是跟随市场性原则（德国可再生能源法§14a再分配2.0条款）

Regulations 法规

- High upfront cost for smart meter (about 100 EUR/a) 高额的智能电表预付费用（每年约100欧元）
- § 14a EnWG has not yet been revised - load-dependent network tariff unavailable 德国可再生能源法§14a还未被修正——没有采用负荷相关的电网费用
- The technical requirements for the "smart meter gateway" (SMGW) are developed very slowly and are purely national - EU alignment needed
  -> is counter-productive to Gaia-X
  "智能电表关口"的技术需求发展很缓慢，虽然只需要德国和欧盟间的协调→与Gaia-X的支持相悖
- The communication protocols on the SMGW are proprietary from the SMGW maker 智能电表关口的沟通协议的所有权归其制造商
- High certification effort for the SMGW and the connected devices 智能电表关口和连接设备的证书成本高
- So far still many unclear technical restrictions such as: access to all relevant data 至今仍有许多不明的技术限制，如所有相关数据的读取