OPTIMIZATION PACKAGE FOR COAL POWER BOILERS & COOLING TOWERS

中国燃煤锅炉及冷却塔优化方案

Innovative easy-to-apply cost-effective solutions to make coal power more profitable and cleaner

独特、易于应用的高性价比解决方案 使煤电获得更多利润空间，并且更加清洁

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PLANT OPERATION FACTS 工厂运营情况

1. Boilers generate all plant emissions
2. Cooling towers generate 90+% plant heat losses
3. Proper operation tuning can promptly lead to noticeable coal usage and CO2 emissions reduction
4. Expertise needed exceeds plant operators' capacity

1. 所有工厂排放物来自锅炉
2. 冷却塔占工厂热量损失90%以上
3. 适当调整运营，煤炭使用量、二氧化碳排放量立即明显减少
4. 工厂运营商缺少专业知识

THE PACKAGE 解决方案

1. Online boiler heat transfer software for engineers
   www.boilerdesignsoftwareonline.com
2. Innovative non-invasive, zero investment tuning expertise for boilers
3. Automated cooling towers evaluation procedure
4. Deasher integrating bottom ash removal, bottom ash afterburning and RDF cofiring

1. 在线锅炉传热软件，工程师用
2. 无侵害性创新，零投资的锅炉调试专业知识
3. 冷却塔自动评估程序
4. 除尘器集成了底灰去除功能，底灰后燃和垃圾衍生燃料共烧功能

PROOF OF CONCEPT #1: SURALAYA POWER PLANT, 4025MW, INDONESIA
概念验证#1：Suralaya发电厂，印度尼西亚4025mw

Summary 小结

1. Total detected boiler tuning potential
   - 487.000 t/y reduced coal usage worth $29 mil (in 2016)
   - 928.000 t/y less CO2 emissions
2. Job completed from plant's control room within 24h
3. Conclusion: Potential likely exists in most cases

GAIN PAYS FOR PLANT EMISSIONS CONTROL SYSTEM!

1. 检测到的锅炉总调节潜力
   - 煤炭使用量年减少487,000吨，价值2900万美元（2016年）
   - 二氧化碳排放量每年减少928.000吨
2. 工厂控制室24小时内完工
3. 结论：有很大潜力

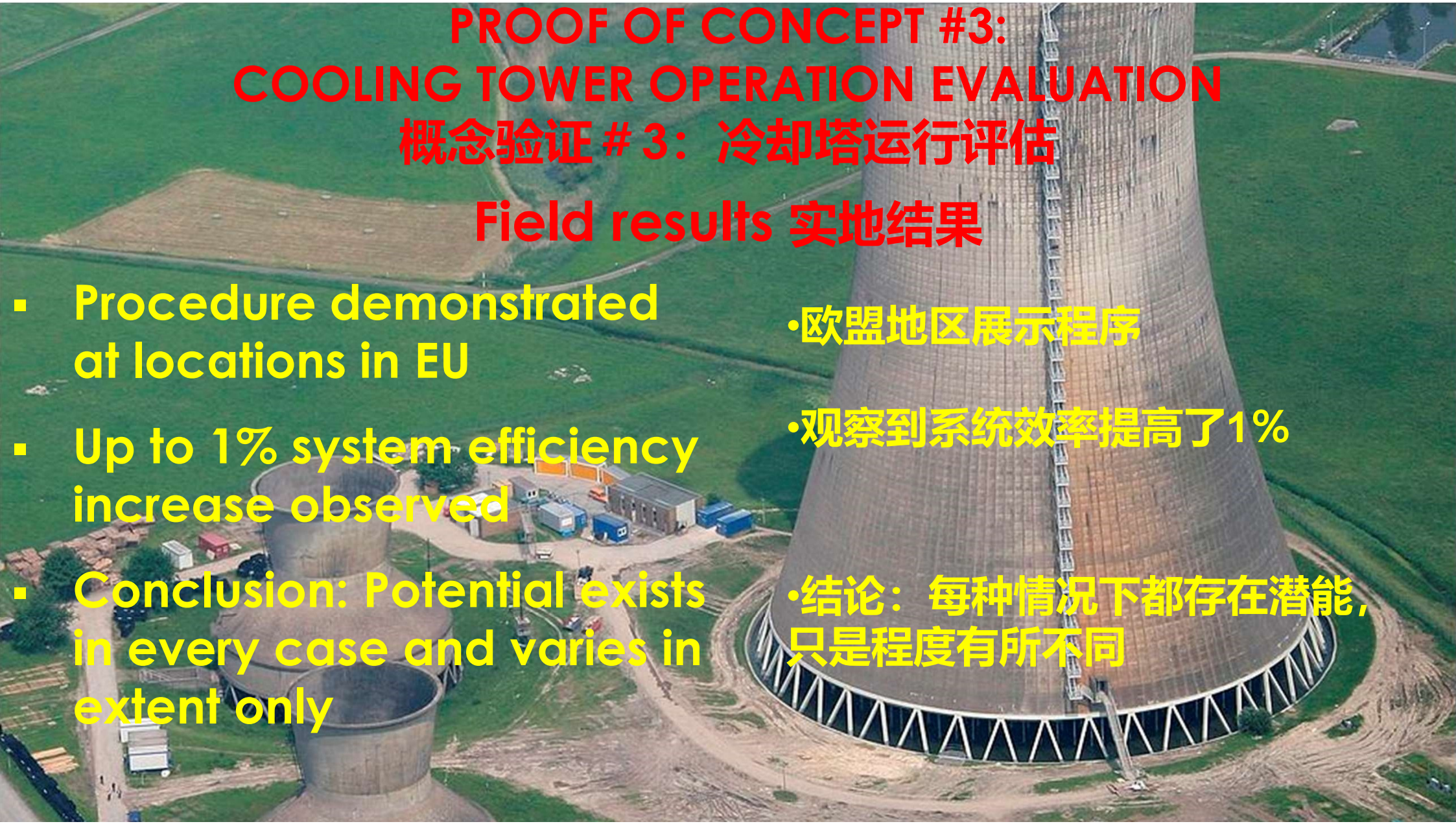
收益支付工厂排放控制系统的费用！

PROOF OF CONCEPT #2:
BOILER HEAT TRANSFER SOFTWARE
概念验证#2：锅炉传热软件

Field results 实地结果

- Boiler from Case study #1 calculated in advance
- 90+% predicted combustion tuning potential confirmed
- Further boiler tuning potential detected

- **案例1中的锅炉是预先计算的**
- **确认预测的90 +%燃烧调整潜力**
- **检测到进一步的锅炉调节潜力**



PROOF OF CONCEPT #3: COOLING TOWER OPERATION EVALUATION
概念验证＃3：冷却塔运行评估

Field results 实地结果

- Procedure demonstrated at locations in EU
- Up to 1% system efficiency increase observed
- Conclusion: Potential exists in every case and varies in extent only

•欧盟地区展示程序

•观察到系统效率提高了1%

•结论：每种情况下都存在潜能，只是程度有所不同

PROOF OF CONCEPT #4: DEASHER
概念验证#4 锅炉除灰器

Field results 实地结果

- Oldest installation commissioned in mid 80s
- Observed facts
  1. Technical claims verified
  2. 50+% lower acquisition & operation cost
  3. No unscheduled stoppage

- **80年代中期开始调试最早的安装**
- **观察到的情况**
  1. **技术要求已验证**
  2. **购置和运营成本降低50%以上**
  3. **没有计划外的停工**

GAIN PROJECTION FOR CHINA 中国预计收入

Assumptions 预计前提

1. Boiler potential: 75% as observed at Case study
2. Cooling tower potential: 1% system eff. boost as observed
3. 50% plants with cooling towers
4. 4% RDF co-firing rate
5. 4500 h/y operation time, 52% capacity factor

1. 锅炉潜力：案例显示为75%
2. 冷却塔：促进系统效率1%
3. 50%厂房带有冷却塔的设备
4. 废弃物衍生燃料混烧率4%
5. 4500 h/y的运行时间， 52%的容量系数

GAIN PROJECTION FOR CHINA预计收益

For 1 mil MW installed capacity 装机容量为100万兆瓦

- Coal usage reduction: 100+ mil t/y
- CO2 reduction: 190+ mil t/y
- 50+% country's communal waste of 200 mil t/y thermally disposed of as RDF without waste incinerators

•减少煤炭用量：每年超过1亿吨

•减少二氧化碳排放：超过1.9亿吨/年

•该国每年2亿吨公共废物，50%以上作为废弃物衍生燃料进行热处置，避免了使用废物焚化炉

THANK YOU!

谢谢！