



Energy Performance Contracting

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What is it?



“The use of guaranteed savings from the maintenance and operations budget (utilities) as capital to make needed upgrades and modernizations to your building environmental systems, financed over a specified period of time.”

-United States Department of Energy

Another Perspective



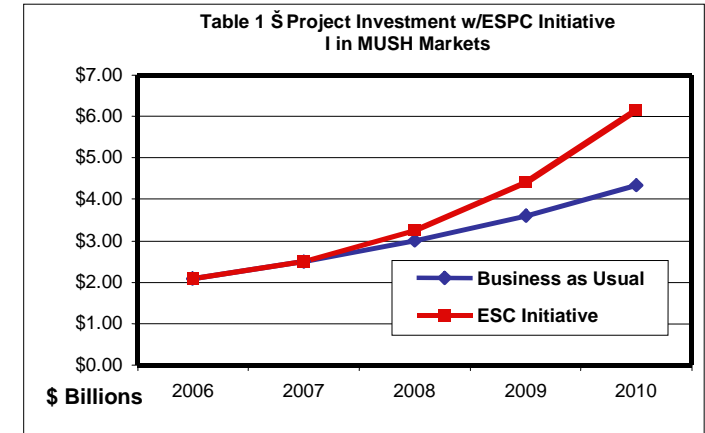
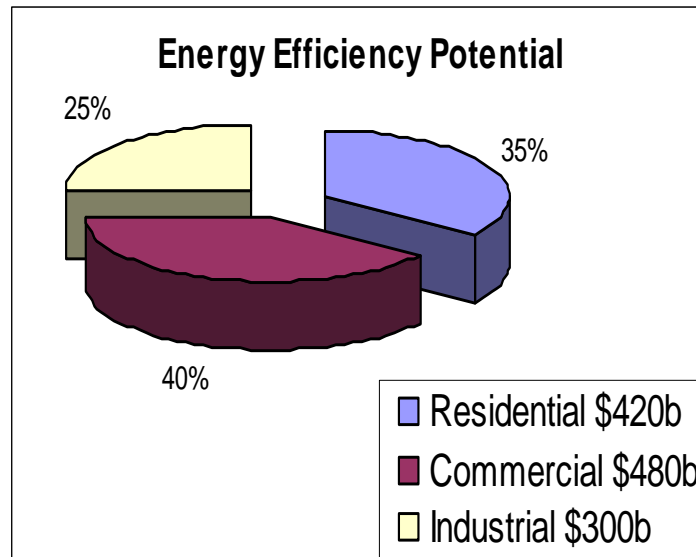
A diversion of utility dollars to effect . . .

- Infrastructure Modernization
- Long term reduction in energy consumption
- Environmental Stewardship
- Our Nation's Safety



Industry Size

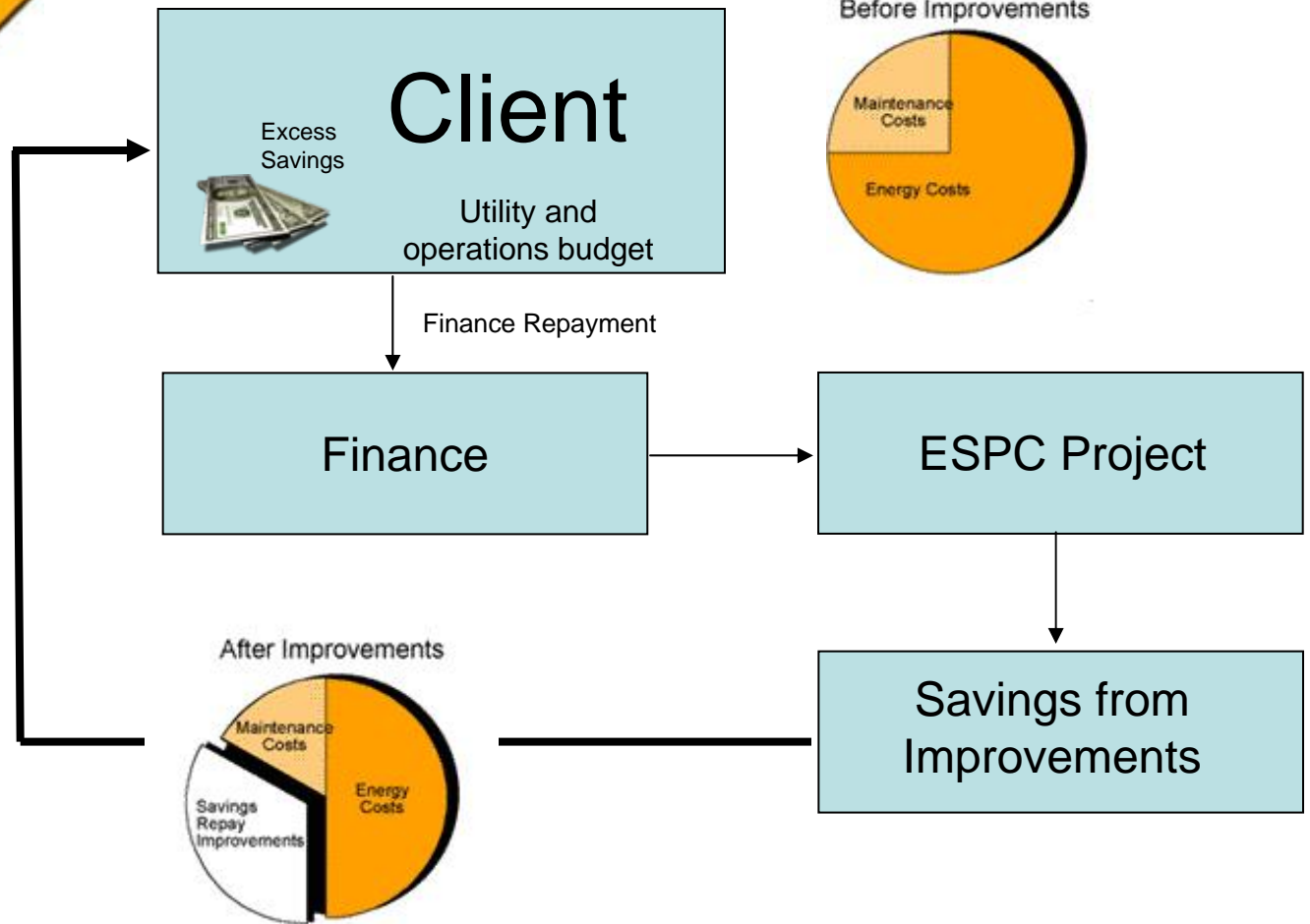
McKinsey July 2009
 assesses total market
 potential for energy
 efficiency @\$1.2T



LBNL's MUSH Market
 Assessment 2006

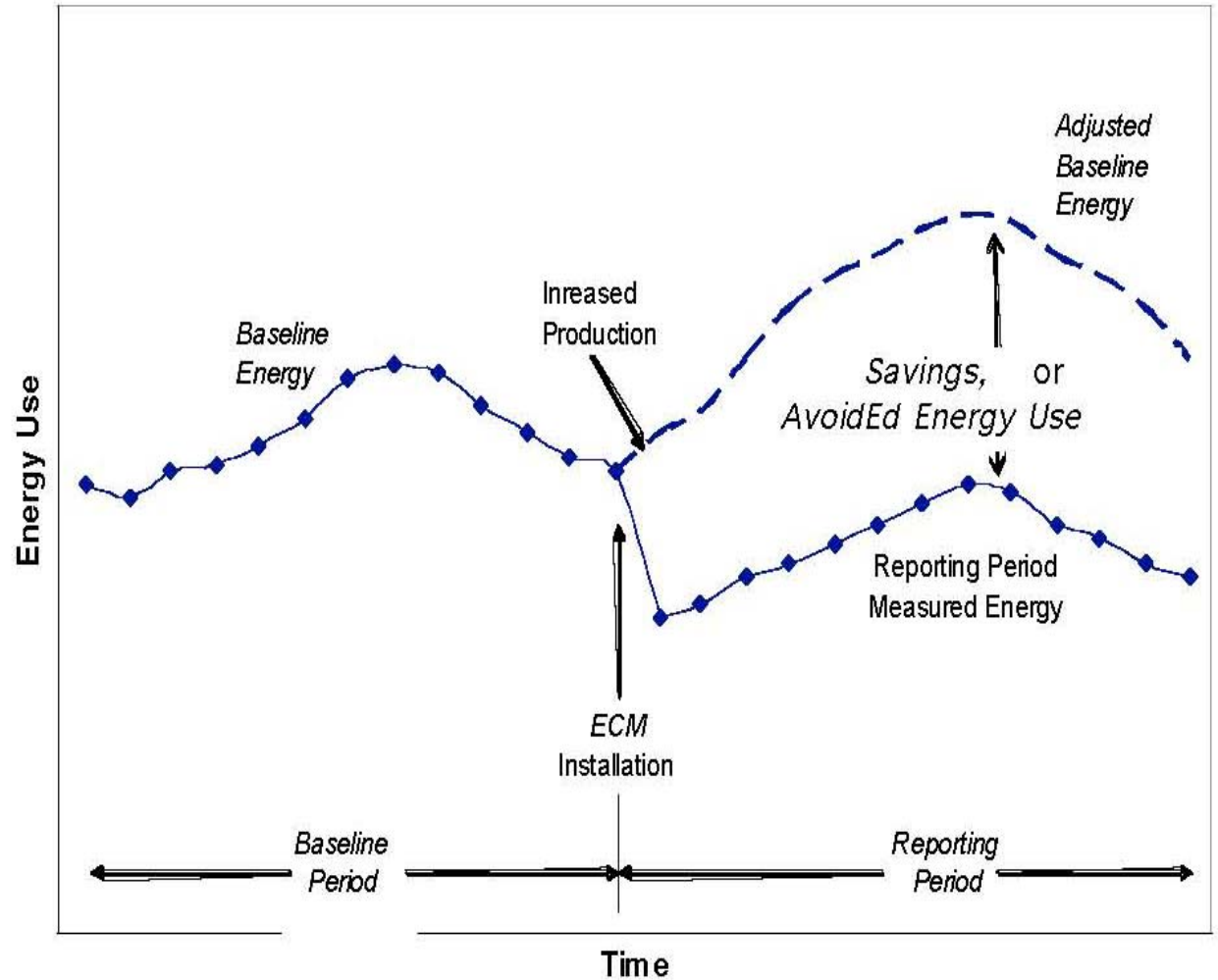
LBNL 62679

How Does The Money Flow?





Results

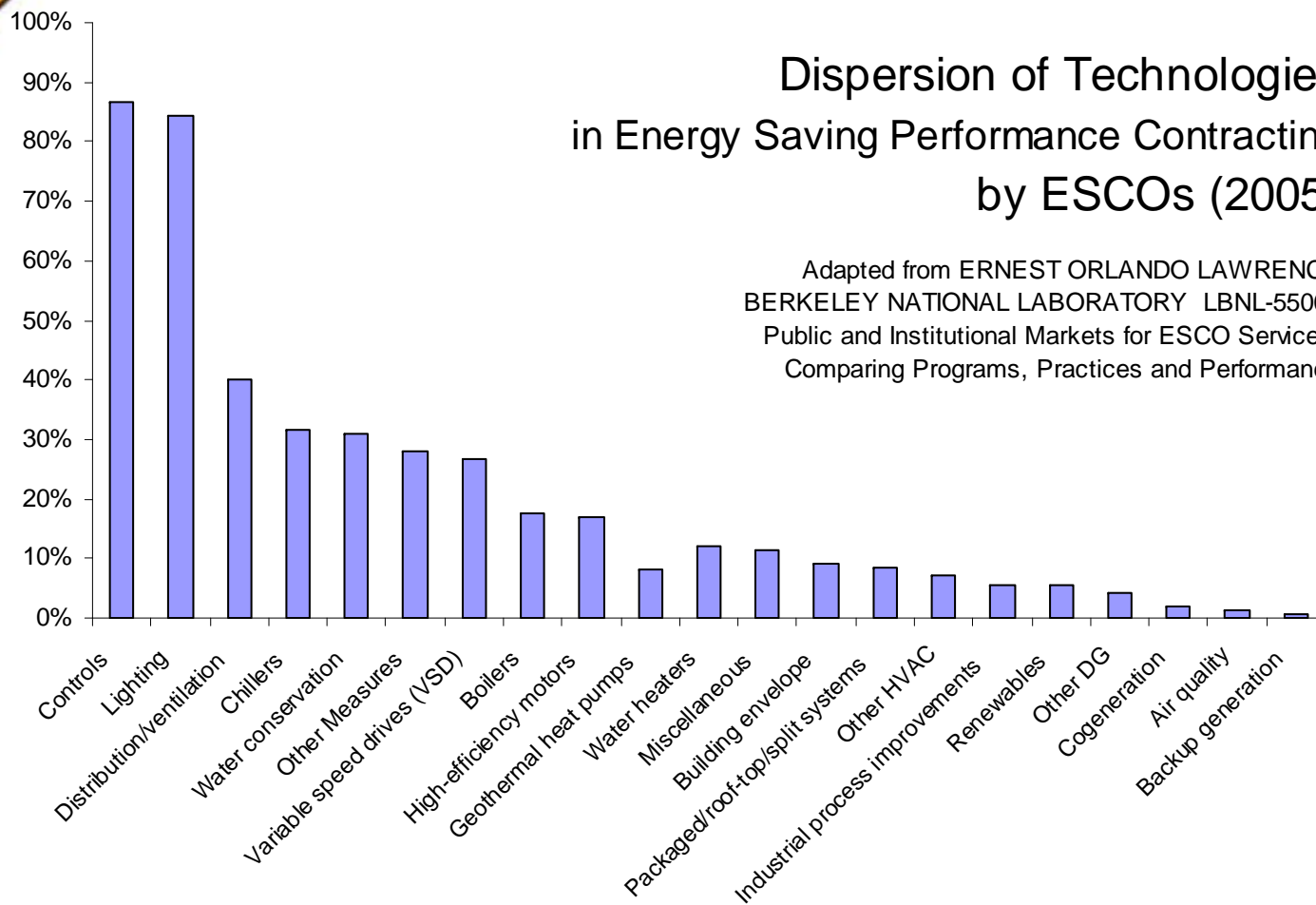




To Do What?

Dispersion of Technologies in Energy Saving Performance Contracting by ESCOs (2005)

Adapted from ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY LBNL-55002
Public and Institutional Markets for ESCO Services:
Comparing Programs, Practices and Performance





Typical Process

Performance Management



Measurement & Verification



Training



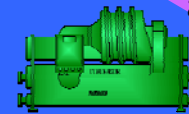
Project Commissioning



Construction Installation



Construction Management



Equipment Selection

Implementation

Project Development



Workshops and Interviews



Comprehensive Energy Audit



Funding Coordination

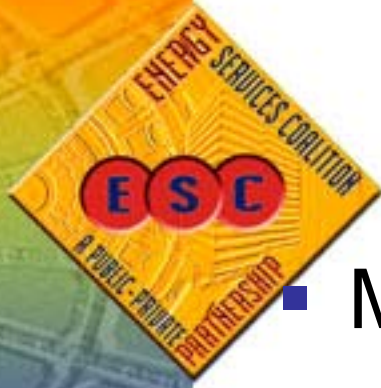


Engineering and Design



Single Source of Responsibility

Financing Vehicles



- **Municipal Lease**

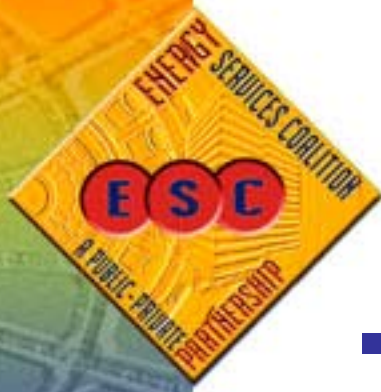
<http://energyservicescoalition.org/resources/financing.htm>

- **Bonds**

- Traditional
- Tax Credit Bond Financing
- Community Development Bonds

- **Grants and Incentives**

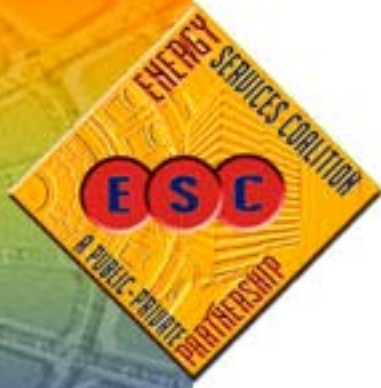
- Utility Incentives
- American Recovery and Reinvestment Act Incentives



Why Use Energy Performance Contracting?

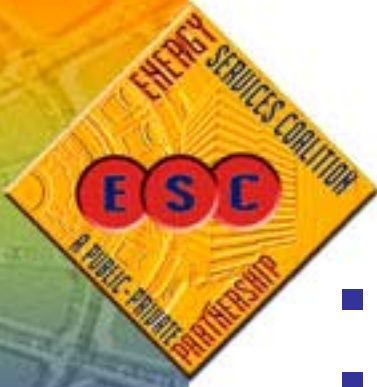
- Speed of the process from beginning to post construction
- Single Point Accountability before, during, and after the construction period.
- Quality Assurance – Performance and savings are guaranteed

Benefits



- Contractually guaranteed measured savings
- Integrated project analysis, design, and construction
- Long term monitoring of savings and performance
- Up-to-date training for facility operating personnel
- Services and materials based upon quality and life cycle value, rather than on lowest first cost

Pitfalls



- Overzealous savings projections
- It's my project, not yours
- We'll work that out later
- Only we can pick products
- Training, who needs training
- Commissioning vs. Start-up
- Energy cost escalations
- Savings based on averages
- Who do I call when
- What assumptions
- Facility dynamics



Energy Service Company's Role

- Identify and evaluate opportunities
- Design systems (engineering), specify & purchase
- Manage construction
- Arrange for financing without upfront costs
- Provide long-term energy management services
- Guaranteed performance!

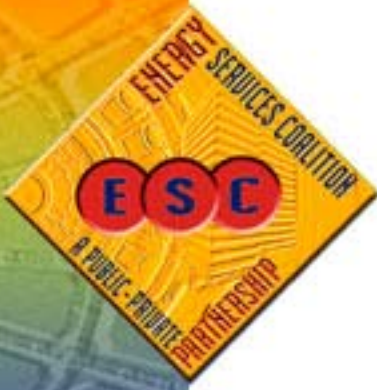
A Turnkey Solution

Energy Services Companies



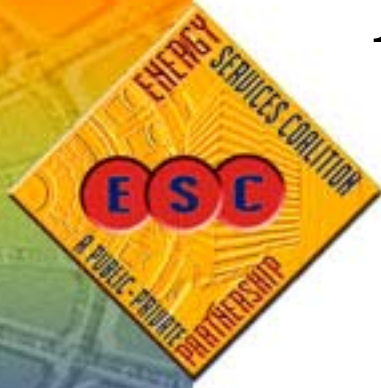
- How do I pick one?

Owner's Role



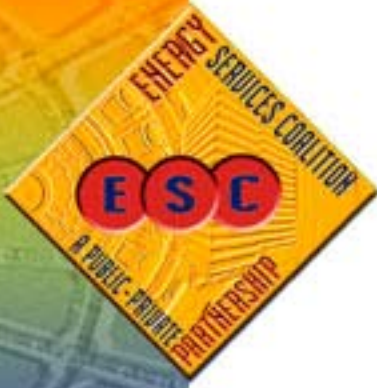
- Oversight
- Clear Understanding
 - Savings
 - Project Scope
 - What If
 - Assumptions
 - Information Sharing
- Win, Win or No Deal

Measurement and Verification



- A. Retrofit Isolation: Key Parameter Measurement
- B. Retrofit Isolation: All Parameter Measurement
- C. Whole Facility
- D. Calibrated Simulation

Questions



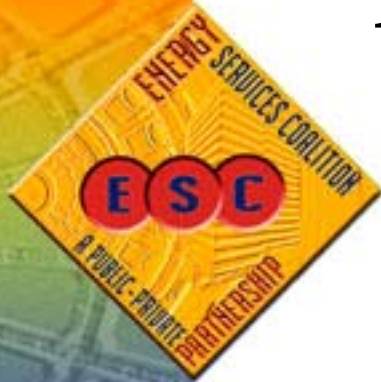
Unresolved . . .

Raises another thought . . .

But what about . . .

Tell me more about . . .

Resources



www.energyservicescoalition.org

Performance Contracting and Energy Efficiency in the State Government Market

<http://eetd.lbl.gov/EA/EMP/reports/lbnl-1202e.pdf>

Introduction to Energy Performance Contracting

[http://www.energystar.gov/ia/partners/spp_res/Introduction to Performance Contracting.pdf](http://www.energystar.gov/ia/partners/spp_res/Introduction_to_Performance_Contracting.pdf)

Emerging Technologies for Energy Savings Performance Contracting in the Federal Sector

http://www1.eere.energy.gov/femp/pdfs/emerging_technologies_ase_report.pdf

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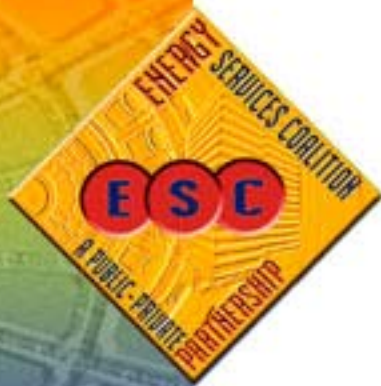
http://www1.eere.energy.gov/femp/pdfs/emerging_technologies_ase_report.pdf

Funding Options and Financial Incentives for On-Site Renewable Energy Projects - Introduction to Energy Performance Contracting

[http://www.naco.orghttp://www.osti.gov/bridge/servlets/purl/796107-9vxYdG/native/796107.pdfq/cfiles/gqi/webinars/pdfs/CatalystFinancial Group_NeilZobler.pdf](http://www.naco.orghttp://www.osti.gov/bridge/servlets/purl/796107-9vxYdG/native/796107.pdfq/cfiles/gqi/webinars/pdfs/CatalystFinancialGroup_NeilZobler.pdf)

Assessing U.S. ESCO Industry Performance and Market Trends: Results from the NAESCO Database Project

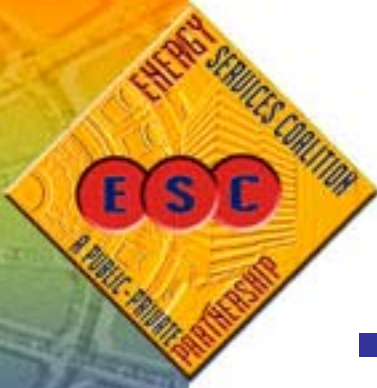
<http://www.osti.gov/bridge/servlets/purl/796107-9vxYdG/native/796107.pdf>



Retrofit Isolation: Key Parameter Measurement

- *Savings* are determined by field measurement of the key performance parameter(s) which define the *energy* use of the *ECMs* affected system(s) and/or the success of the project.

Retrofit Isolation: All Parameter Measurement



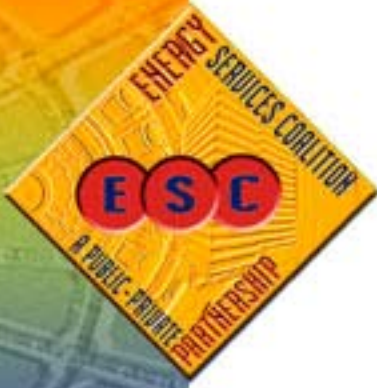
- *Savings* are determined by field measurement of the *energy* use of the *ECM*-affected system.

Whole Facility



- *Savings* are determined by measuring energy use at the whole *facility* or sub-*facility* level.

Calibrated Simulation



- *Savings* are determined through simulation of the *energy* use of the whole *facility*, or of a *sub-facility*. Simulation routines are demonstrated to adequately model actual *energy* performance measured in the *facility*