

Internalizing Externalities

The Green Tag

Environmental Compliance & Infrastructure

- Infrastructure

- Power

- Electrical Service
- Heating / cooling
- Movement
 - People
 - Freight
 - Fuel and supplies

- Water

- Land Use

- Security

- Environmental Compliance

- Air

- Waste Water

- Stormwater

- Solid Waste

- Noise

Costs & Cost Management

- Direct Costs
 - All Budget Areas
- Societal and Political Costs
 - Relationship(s) with the Community
- Cost Off-sets
 - Revenue enhancers
 - Avoidance

The Stage



- The facility is a community whether it is self-contained or dependent.
 - Every time someone uses water we incur a direct cost.
 - Every light, every power supply (standby or operational) incurs a direct cost.
 - Every discarded item (component/packaging) triggers a cost response.

The Stage – part II

- Every passenger, every employee, every storm event triggers a direct cost and, an environmental cost and an environmental response.
- Every direct cost component triggers an indirect cost, and arguably, presents a liability to the host community.



Internalizing Externalities

Cost identification and accountability of these “indirect costs,” and the subsequent recovery of the indirect costs become one of the most critical components in ensuring a facilities sustainability. Hidden within many of those indirect cost is a “Green Tag.”

Therein lies another common theme – **Accounting for the “Green Tag.”**

Cost avoidance or revenue potential?

The Challenge Reiterated

- Airports are faced with a number of challenges relating to infrastructure, resource management and environmental requirements.
 - Waste disposal
 - Building heating or cooling
 - Electric energy
 - Sanitation
 - Stormwater treatment and management
 - Control/reduction of air pollution



The A-Ha

- Aforementioned services for most airports are provided by the surrounding communities **for a fee.**
- The need to reduce air pollution emissions from ground handling equipment suggests increased electrification of gates.
- Increase electrification reduces the noise contribution.
- Alternative solid waste management options offer budgetary savings and reduce security risks.
- Distributed generation offers unique energy cost savings.
- Enhanced waste water treatment options provide greater flexibility in water management and reduce consumptive use and demand.

A-Ha – part II

- The adoption by the airport authority of on-site, or near on-site waste conversion to a renewable energy supply reduces operating expense and provides the potential for cost avoidance and revenue generation.
- The medium Btu gas produced through waste conversion can be used to produce steam that, in-turn, can be used to produce electricity for airport consumption, to reduce peak demand parameters, or marketed to adjacent users under distributed generation rules or, added directly to the grid under contract.
- Recovered steam from co-generation and/or the generated gas itself can be used to meet heating and cooling requirements.

A-Ha – part III

- Airport sewage sludge can be converted to usable forms of renewable energy.
- Waste management services can be extended to surrounding communities at a cost savings, thereby, promoting a good neighbor relationship.
- The waste conversion facility in the example presented has a small footprint and would likely not present any obstacles that would pose a flight safety issue.
- Plant wastewater treatment can process stormwater, oily water, pesticide / fertilizer contaminated water.
- Excess treated water can be used to reduce water demand for irrigation, suppression, washing, and ?

What's Missing

- Notwithstanding governmental mandates to procure green energy a.k.a. “renewable portfolios.”
 - Cost-benefit has always crippled energy conversion technologies in commercial application but for “standard offer contracts” or direct subsidies.
 - On the other hand, cost avoidance which can be internalized by a legislative unit (airport authority) solves the equation imbalances.



Bottom Line

- Infrastructure utopia:
 - Solid waste management costs and logistic options abound.
 - Energy dependence reduced or eliminated.
 - Water consumption reduced and waste water management options enhanced.
 - Air emission and noise reduction potential optimized.
- The *Green Tag* accounted for.

Enhanced Control

- Dependency / inter-dependency dynamics change.
- Cost matrix and accompanying metrics change.
- Sustainability Matrix is Redesigned.

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