CO_2 Reduction:

Examples of possible Best Practices

Measures Seen In Action

CO_2 Reduction
Sample Measure 1: LED Installations (e.g. Arlanda Airport)

LED installations today:

- 2 car parks
- Garage for heavy vehicles
- Workshops
- Check-in desks
- Boarding desks
- Security control
- Technical rooms ventilation
- Down-lights for heights of 3m, 5m and 8m
- Spotlights in stores
- Changing light sources in old armatures

10,000 LED units installed:

- >50% lower installed load
- Reduced energy costs by 2.5 MSEK/year
- Lower service and maintenance costs
- Failures less than 0.1%
- Better interior climate - less hot
- Satisfied customers

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Steering of lighting and engine pre-heaters:

- Staff at the ramp tower can control the lighting and adjust it to where the aircraft is parked
- Starting the engine heaters for snow removal vehicles can be planned according to the weather
- Staff at the park can control the lighting depending on the use of parking spaces
- Reduced energy consumption of electricity by 1,000,000 KWh/year

Demand controlled ventilation - Optimization according to:

- Needs from operations

Regulated air flow according to:

- Air quality
- Temperature Savings of electricity
- Reduced air flow by 30%
- Reduced electricity for air blow engines by 50% or 150,000 KWh per year per terminal

Elements of success:

- Dedicated unit with energy in focus
- Commitment - all employees
- Optimization of energy systems
- New more efficient technology
- Capacity to invest

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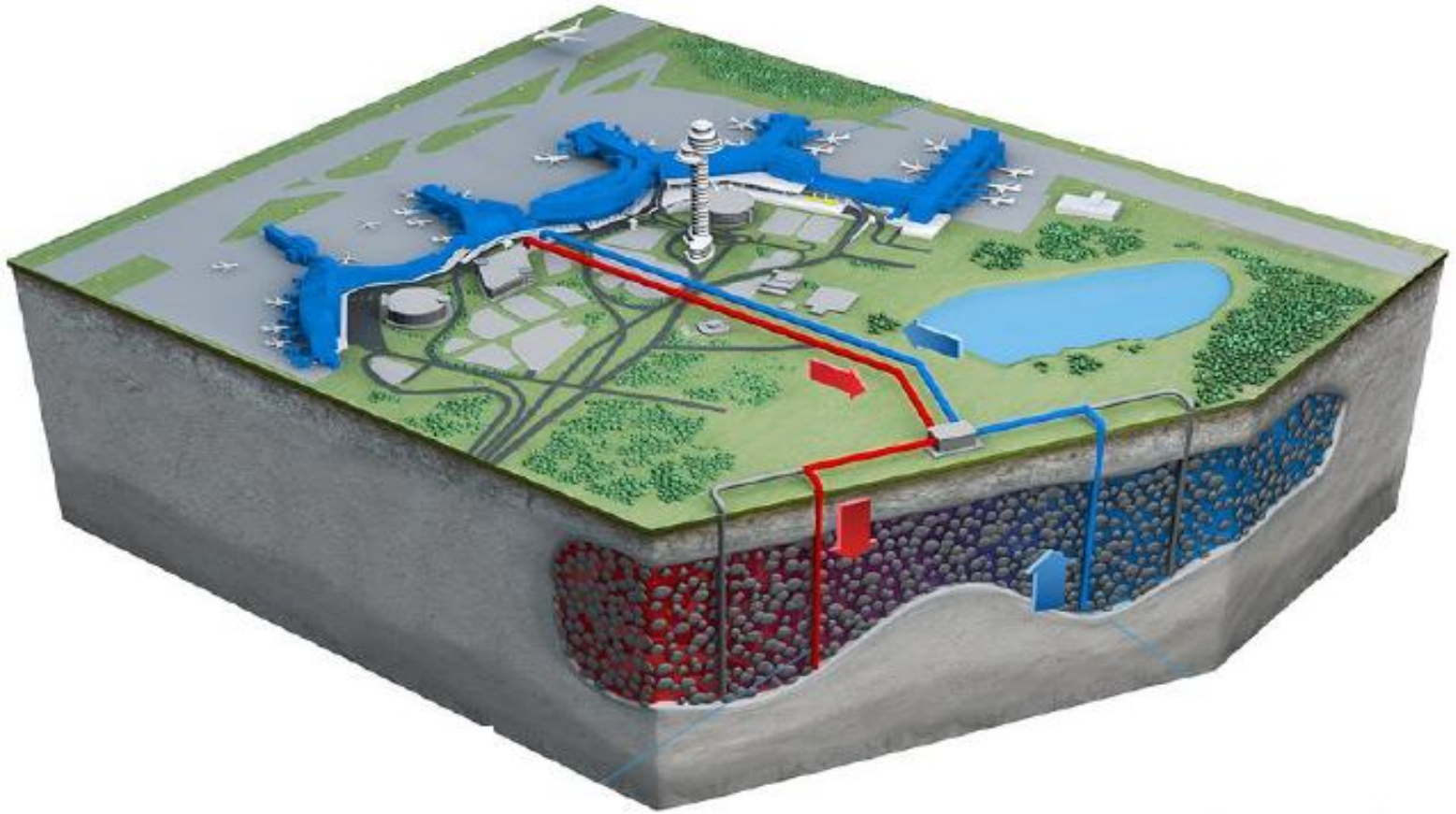

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Sample Measure 2: Substitution of Cogeneration (e.g. Leipzig Airport)

Optimization or substitution of cogeneration units (increase of combined generation of heating, cooling and power (trigeneration) in connection with optimized use of heating and cooling storage systems)

3 CHP module:

- **Nominal capacity:**
  - **Electric: each 752 kW**
  - **Thermal: each 875 kW**
- **Number of hours of full load use: relatively low, doesn't reach the planned values**
- **Heat-controlled operation only but not optimally utilized**

Energy-economy constraints:

- **Increase internal electricity production**
- **Coverage of the total cooling capacity during the summer through absorption cooling machines in combination with cold water storage - positive economic effect**
- **Target: electricity production > 10 GWh - additional energy production through optimized combined heat-power-cooling system**

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Sample Measure 3: Alternative Traction

- Airport operations rely heavily on vehicles in view of distances and weights involved
- Currently, in most airport regions, older vehicles are in use
- Use of more environmentally-friendly vehicles preferred
- Not limited solely to travel operations e.g. WheelTug© is uses to push back aircraft from the terminal building towards the runway (system still being tested)

Advantages:

- More environmentally-friendly airport operations
- Quieter operations (in the case of electric vehicles), particularly indoors e.g. baggage handling areas
- Alternative systems can make operations more self-sufficient e.g. with WheelTug© an aircraft can manoeuvre itself
- Vehicles can be re-charge when not in use and at any location

Disadvantages:

- Major cost for replacing current vehicle fleet
- At present, shorter batter life (in the case of electric vehicles)
- More power needed when weight is involved e.g. luggage trailers thus more frequent re-charging will be required
- More vehicles than normally required in view of charging times

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Surface Access
Sample Measure 4: Company Travel Plan

- Many employees do not require their private car for work purposes
- Typical AM and PM peak traffic is high because of home-to-work trips, resulting in congestion, especially at approach roads
- Such cars occupy valuable land space within the region when parked, which do not really need to be there
- Incentives for employees
- Direct connection to national public transport services
- This can take on many forms e.g. car sharing, company transport, travel cards etc.

Advantages:

- Significant reduction in vehicles levels (and hence CO_2), most noticeable in employment-intensive areas
- Raises people's awareness to personal CO_2 contribution
- Possibility of land becoming available for other uses, such as landscaping and other environmental improvements

Disadvantages:

- Can't "force" employees to change travel habits
- Reliance on others for the home-work-home trip
- Access/Travel problems if system breaks down

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Sample Measure 5: Dedicated Route Bus (e.g. Barcelona Airport)

- Many airports have dedicated public transport routes
- These serve both passengers and employees
- Often connecting main tourist areas with the airport
- Actual vehicles used are environmentally-friendly, in terms of technology (engines, fuels etc.)
- Ties in very well with company travel plans

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Advantages:

- Significantly higher passenger capacity than single occupancy vehicles, thus also reducing overall traffic levels
- Less pressure for on-site parking, particularly in the case of employees
- Direct connection between airport and major tourist hubs, therefore more attractive
- Use of alternate modes of power e.g. bio-fuels, battery-operated etc.

Disadvantages:

- Can't "force" passengers and employees to use them
- For full efficiency, on-street measures are required e.g. dedicated bus lanes, priority at junctions etc.
- Expensive initial cost (when considering purchasing vehicles, implementing on-street measures etc.)
- Still a road-based system i.e. adding to overall traffic levels

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Thinking ‘Outside the Box’!

Not all measures and proposals need to be directly related to the airport and airport operations

Some examples:

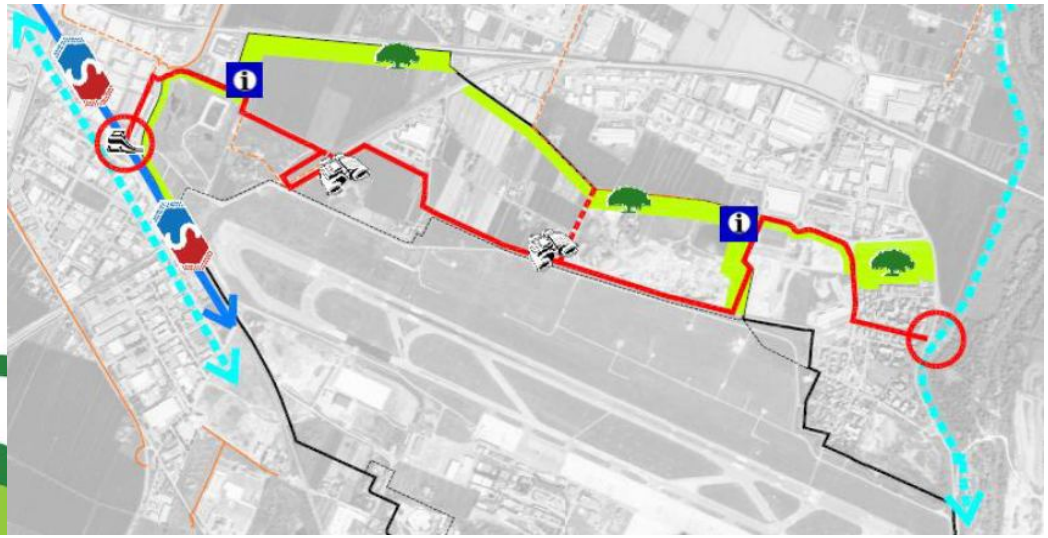
Prague Airport:

Honey production within the airport perimeter

- **Alternative use for ‘dead’ areas of the airport**
- **Used as an educational tool**
- **Alternative (minor) source of income**

Bologna Airport: Green Belt

- Buffer zone between airport/operations and surrounding residential areas
- Upgraded landscape and environment
- Compensates airport emissions by absorbing CO_2 through vegetation and soil
- Reduces air pollution
- Improves the local ecological network and enhance the territorial ecology



Malta Airport: Solar Farm

- Along similar lines, MIA have installed a number of PV panels on its roofs
- Given the large areas of vacant land within the airport perimeter, there is the possibility for extending this initiative
- An example of utilizing airport area for non-typical aviation uses
- This particular initiative is very much dependent on flight safety regulations