



*and the Environment*

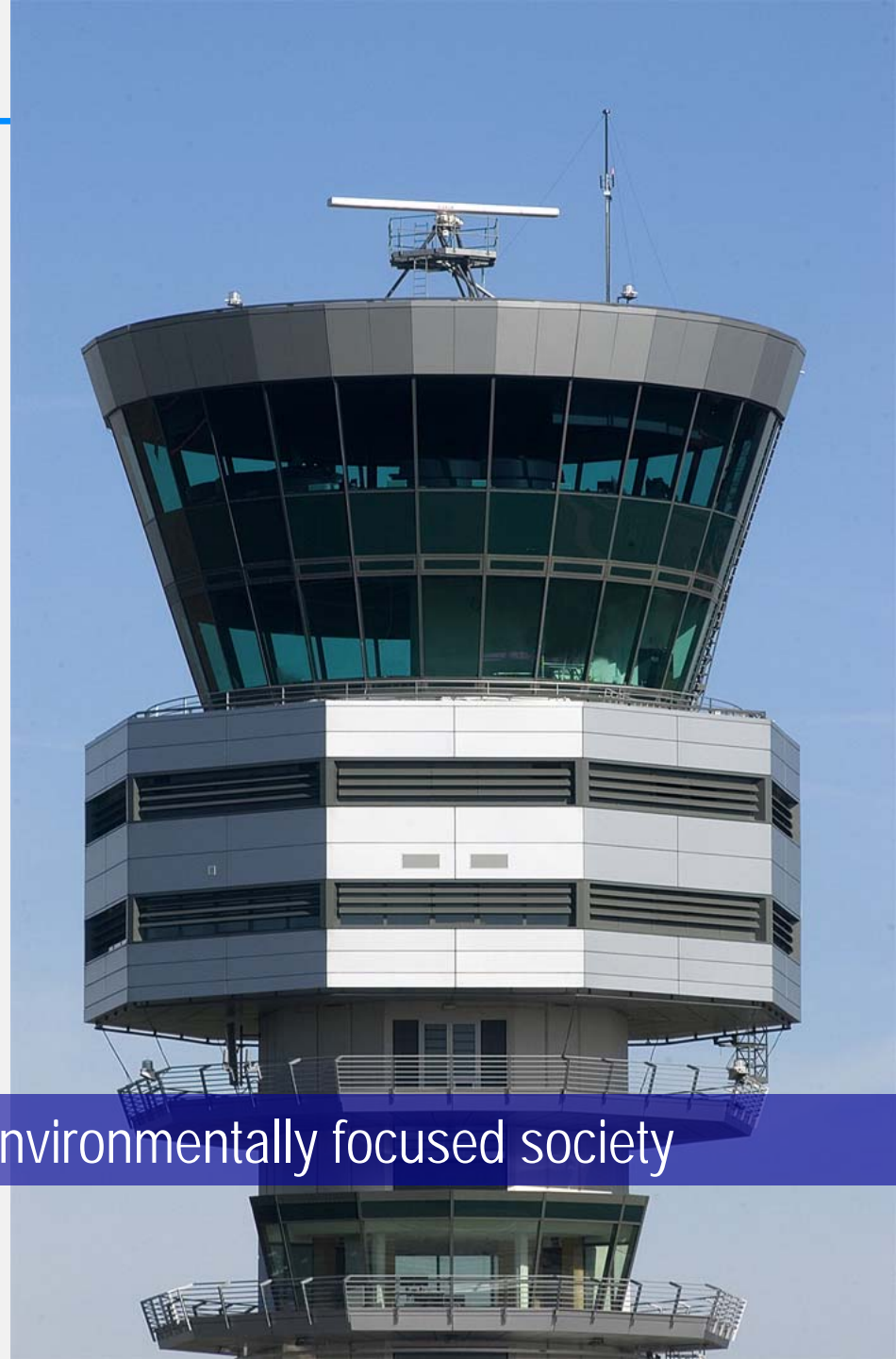
Speaker: Guy Viselé  
External Communication Advisor  
ABC User Committee, February 2<sup>nd</sup> 2009

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- Belgocontrol
- Environmental approach
- Emission management

Serving today's aviation in an environmentally focused society



# *Belgocontrol Missions*

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- Our priority is to guarantee safety
- We deliver the requested capacity
- With the best punctuality
- With a maximal efficiency
- Taking the environment into account

# Belgocontrol

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- Belgocontrol guarantees the safety of air navigation in the controlled civil airspace above Belgium and the Grand Duchy of Luxembourg for which Belgium is responsible, as well as at the five Belgian public airports:
  - The airspace above Belgium:
    - From ground level to flight level 245 (24,500 feet = 8,000 metres altitude).
    - The control of the airspace situated above 24,500 feet has been delegated to MUAC (Maastricht Upper Area Control Centre), managed by Eurocontrol.
  - The airspace above the Grand Duchy of Luxembourg from flight level 135 (13,500 feet) to flight level 245.
  - The airports of Antwerp, Brussels Airport, Charleroi, Liege and Ostend.



# Movements 2007 - 2008

## Belgium - Luxembourg

	2007	2008	var %
CANAC	578.279	585.808	1,30
BRUSSELS AIRPORT	264.366	258.795	-2,11
REGIONS	287.687	302.721	5,23
TOTAL BELGOCONTROL	1.130.332	1.147.324	1,50
MUAC	707.526	714.488	1
TOTAL BELGIUM	1.837.857	1.861.812	1,30



# *Sustainable development*

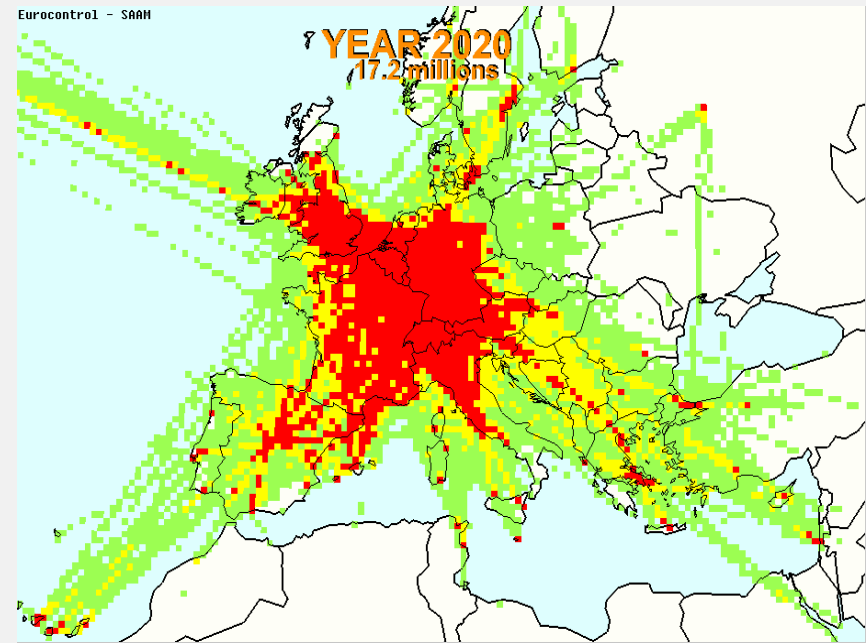
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- Environmental decisions are political choices.
- For aviation, safety is and remains the top priority. Belgocontrol checks if new procedures respect safety (regulatory separations, non-conflict between departure and arrival routes, Obstacle Clearance Limit), converts decisions in aeronautical terms and publishes them according to ICAO's schedule.
- Belgocontrol wants to play a proactive part through the study, proposal and implementation of means, procedures and techniques that have a positive effect on the environment without compromising safety and efficiency in air traffic management.



# The challenges of traffic growth

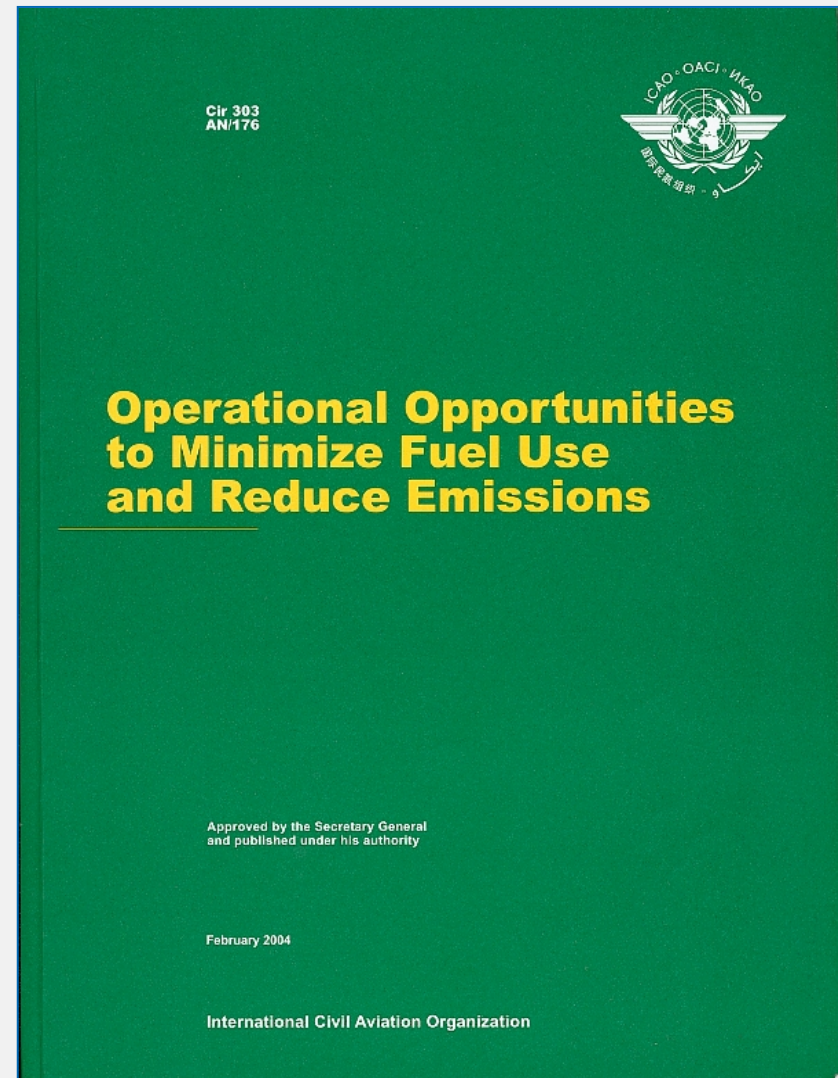
- 2008: 10,000,000 controlled movements (EUR)
- Air traffic will have doubled by 2030
- The complex nature of traffic is an important factor
- The Belgian airspace is the busiest and the most complex in Europe :
  - at the crossroads of East-West and North-South traffic
  - ascending and descending « regional » traffic
  - approaches at local airports





# Limiting aircraft emissions

- ICAO Circular 303:  
Operational Opportunities  
to minimize Fuel Use and  
reduce Emissions.
- Chapter 6 : Air Traffic  
Management





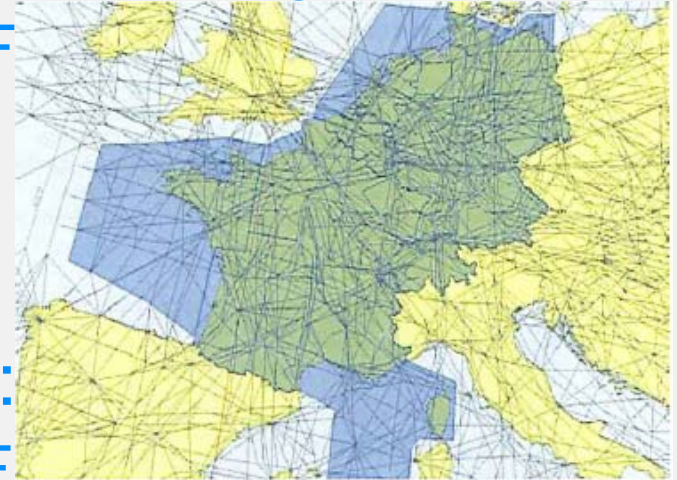
# TEN PRINCIPLES :

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- Fly most efficient aircraft for the sector,
- **Taxi the most efficient route,**
- **Fly the most efficient route,**
- **Fly at the most efficient speed,**
- **Operate at the most economical altitude,**
- Maximise the load factor,
- Minimise the empty aircraft weight,
- Load the minimum fuel commensurate with safety,
- Minimise non-revenue flights,
- Maintain clean and efficient aircraft.

# *Fly the most efficient route*

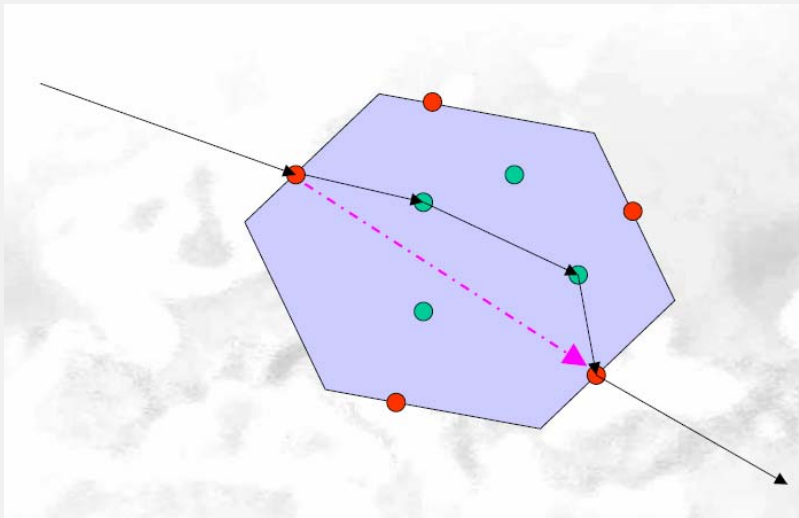
- Potential reduction of 6-12 % of emissions by better Air Traffic Management using:
  - Improved flight planning (CF)
  - More direct routes
  - Redesign airspace
- Belgocontrol is involved in:
  - the definition of the future “Functional Airspace Blocks” (FAB) of the Single European Sky (SES)
  - improvement of the Belgian airspace, in particular through civil-military collaboration for the Flexible Use of Airspace (FUA)



# Shorter flight routes

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- Having positive impact on fuel burn & emissions
  - Shortest route (minimise track-miles)
    - Flexible Use of Airspace
    - Direct routes
  - Predictability for the pilot e.g. to allow absorption of delays by applying lower speed (rather than having to hold or to get track extensions by vectoring)



Source : Eurocontrol

# Optimised flight planning

- Coordinated airports => airport slots
- European CFMU (\*) => air slots
  - emission reduction by proposing more direct routes whenever possible
  - and by keeping the aircraft on the ground, with their engine switched off, until they receive an available slot, rather than make them take off and burn fuel uselessly.
- **CDM** : Collaborative Decision Making
  - Extensive exchange of information among operational entities on the airport (Belgocontrol, airport, operators, handlers)
  - Sequencing of departures  
Implementation of TOBT (Target Off-Block Time, that allows the restriction of the number of aircraft at the holding point)
  - Allows just-in-time engine start-up, limit taxi-times
  - Reduces ground noise as well as local emissions & fuel consumption



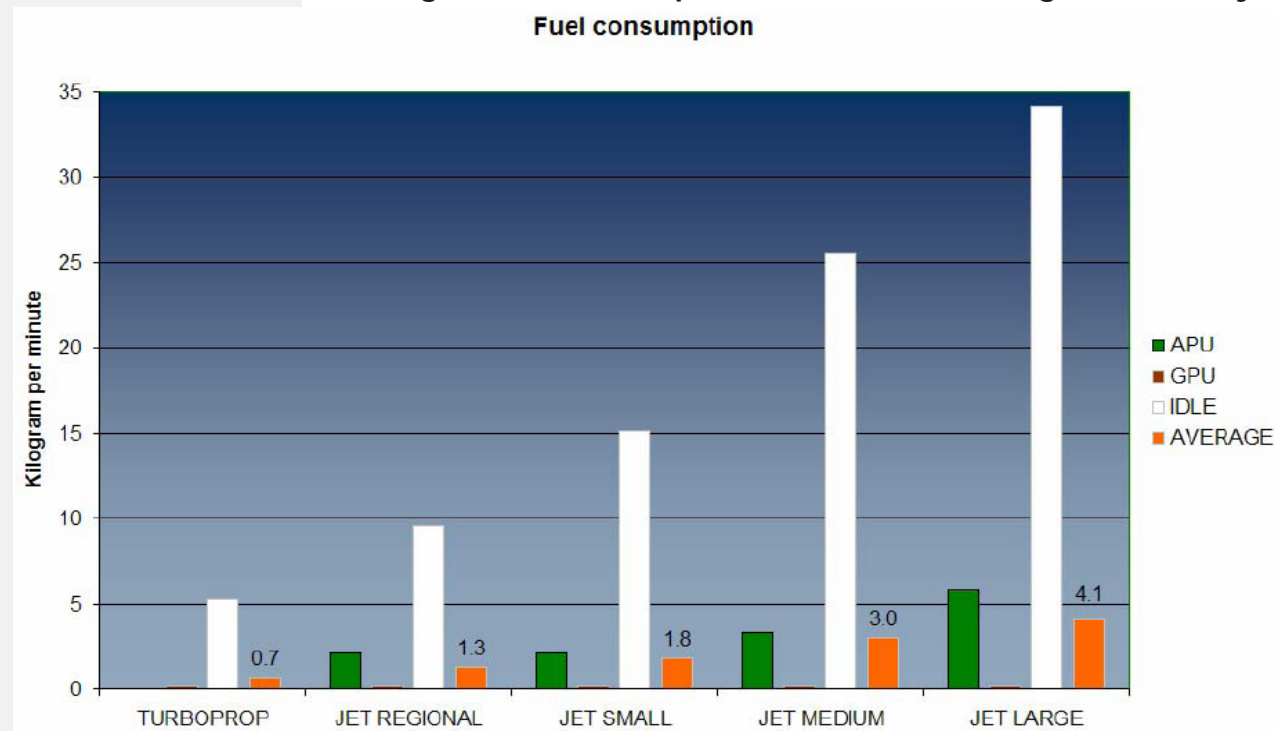
(\*) Central Flow Management Unit



# CDM: Minimising engine running time on the ground

- Aircraft power is provided by either:
  - Aircraft main engines
  - APU (Auxiliary Power Unit)
  - GPU (Ground Power Unit)

Average fuel consumption of a one minute ground delay

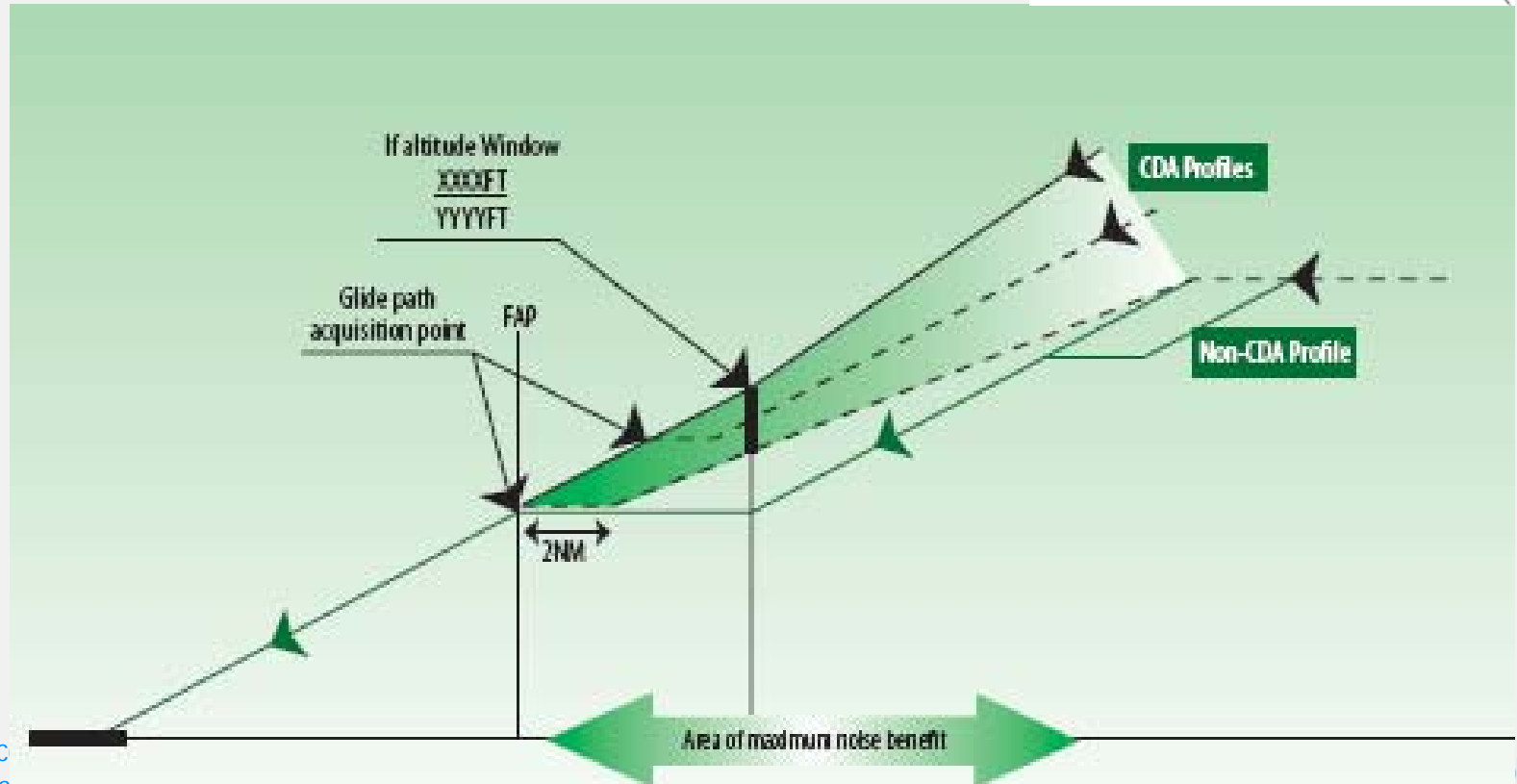
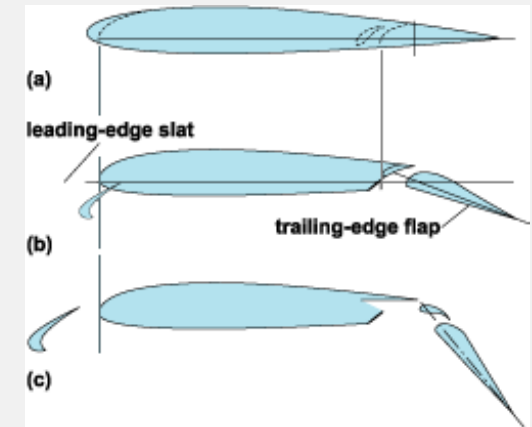


Source: EEC SEE 2006 006

- Just in time start-up delivery: CDM (Collaborative Decision Making)

# Efficient flight procedures

- Continuous climb
- Continuous Descent Approach (CDA)
- Low Thrust / Low Drag (turbulence)
- E.g. speed compatible with clean airspeed in arrival phase





# Continuous Descent Approach & Belgocontrol

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- Continuous Descent Approach (CDA):
  - Difficult to implement in complex and busy airspace
- New approach to the CDA: “Look for the possible”
  - Periods with low traffic loads
  - Only for those flights where circumstances permit CDA in a safe manner with no negative impact on capacity
  - As much as possible aligned to current operating procedures
  - Starting at low flight levels and gradually extend to higher altitudes
- Already applied to some extent at Brussels, Charleroi and Ostend airports
- Better opportunities with Belgian Airspace Reorganisation (BARE) project & Functional Airspace Blocks (FAB)

# Efficient flight altitudes

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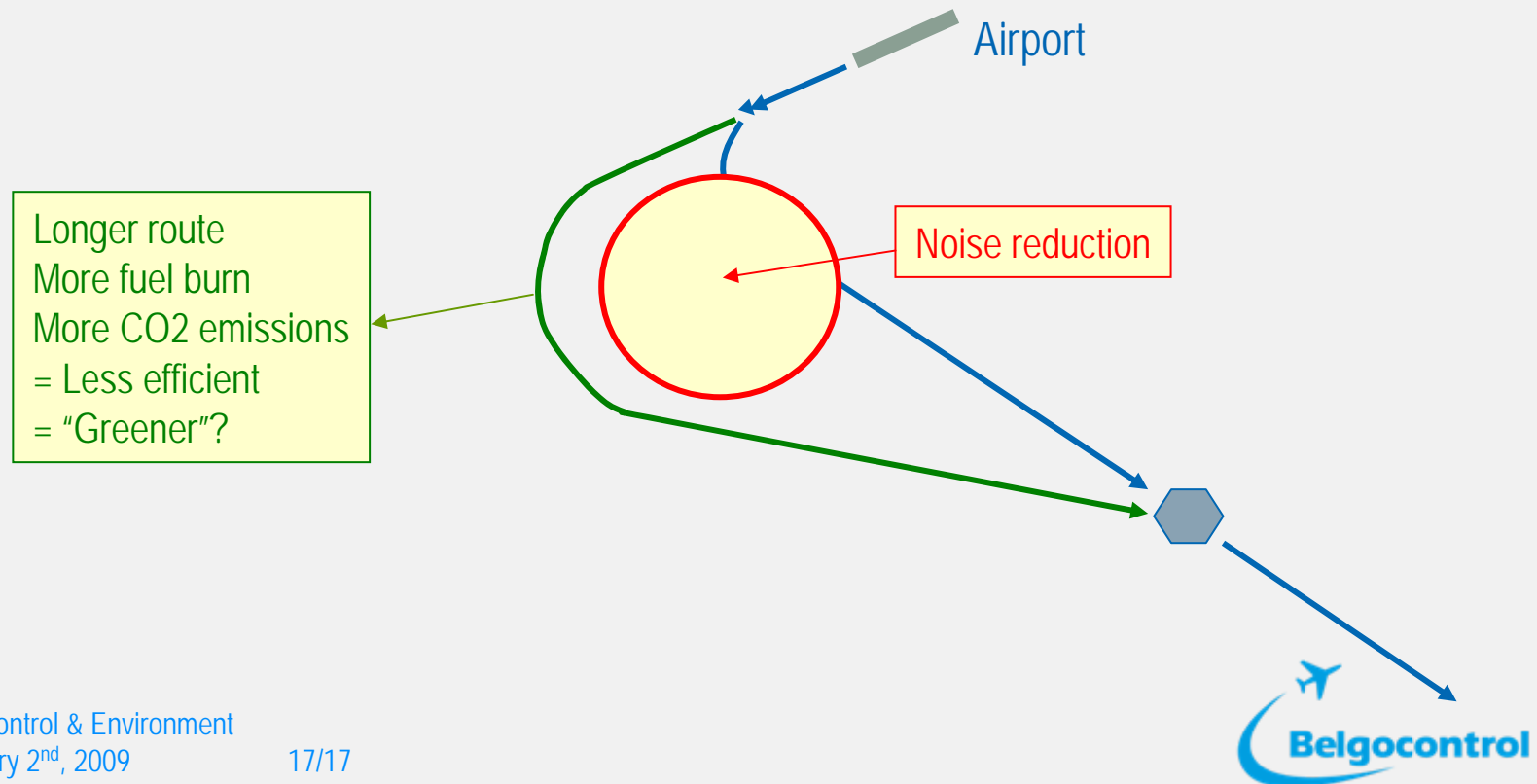
## Optimum Cruise altitudes

- Most fuel efficient cruising altitudes :
  - depend on aircraft type, direction of flight and weather conditions,
  - most economical altitudes usually between 30,000 and 40,000 feet.
- This is the height at which contrails tend to form the easiest
  - => Trade off between CO<sub>2</sub> and contrails.
- Scientific evidence on contrails is still uncertain while CO<sub>2</sub>-emission clearly has a major climate change impact



# Interdependency Noise & Emissions

- Synergies
  - CDM: positive impact on both local noise & emissions
  - Continuous Descent Approach: idle thrust reduces both emissions and noise
- Opposite effect
  - Longer flight distance to avoid densely populated areas



# Conclusions

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- Emissions of various nature cannot be studied in isolation
- An improvement in one kind of emission may result in an increase in another kind of emission
- Noise against emissions
- Needs good scientific knowledge taking into account **interdependencies** to help politicians define priorities in environmental measures