

En-Route VFE

FABEC VFE Workshop

Maastricht UAC / Virtual Meeting, 10 December 2020

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Agenda

- 1. How ANSPs' are measuring En-route VFE ?
 - Tools used
 - Share of inefficiencies

- 2. ANSPs' point of view on En-route VFE
 - A complex context
 - ANSPs' reactivity
 - Impact of RAD restrictions on En-route VFE

- 3. Interdependencies with other performance indicators



1. Tools used to measure En-Route VFE

- PRU methodology
 - [Generic approach](#)
 - Based on a reference of city pairs and GCD

- Methodology developed by ANSPs
 - Indicator 3Di (NATS)
 - [Indicator 3D](#) (DSNA)

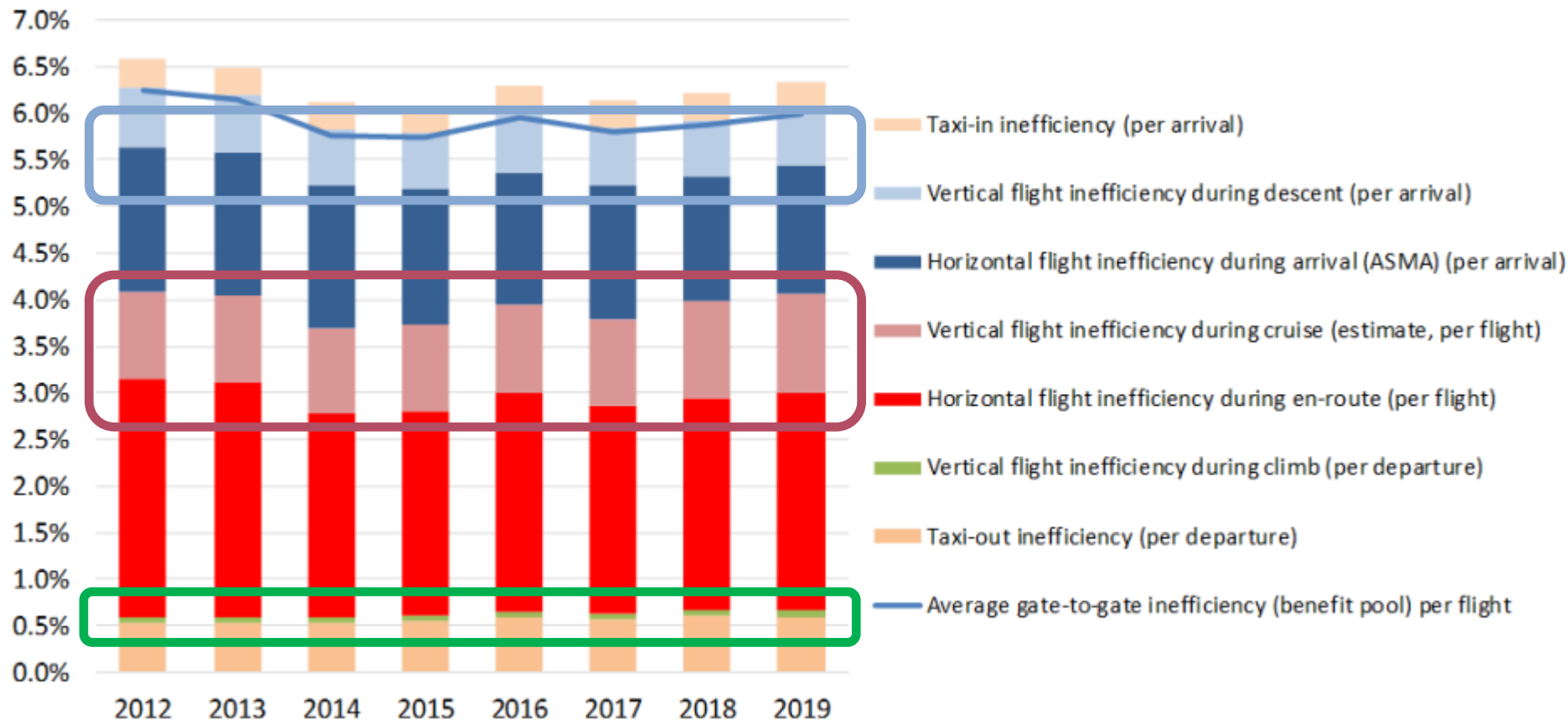
- NEST computation
 - Common tool at ECAC level
 - Based on scenarios comparisons
 - Assessment on each flight
 - Good tool for upper airspace, less adapted to lower airspace



1. Share of inefficiency

Perf Review Report 2019: 6% of inefficiencies on fuel at ECAC level

=>Amongst the 6% of inefficiency, around 0,5% is due to VFE in arrival phase, and around 1% is due to VFE in **En-Route phase**. Almost no inefficiency in **departure phase**



2. ANSPs' point of view on En-route VFE

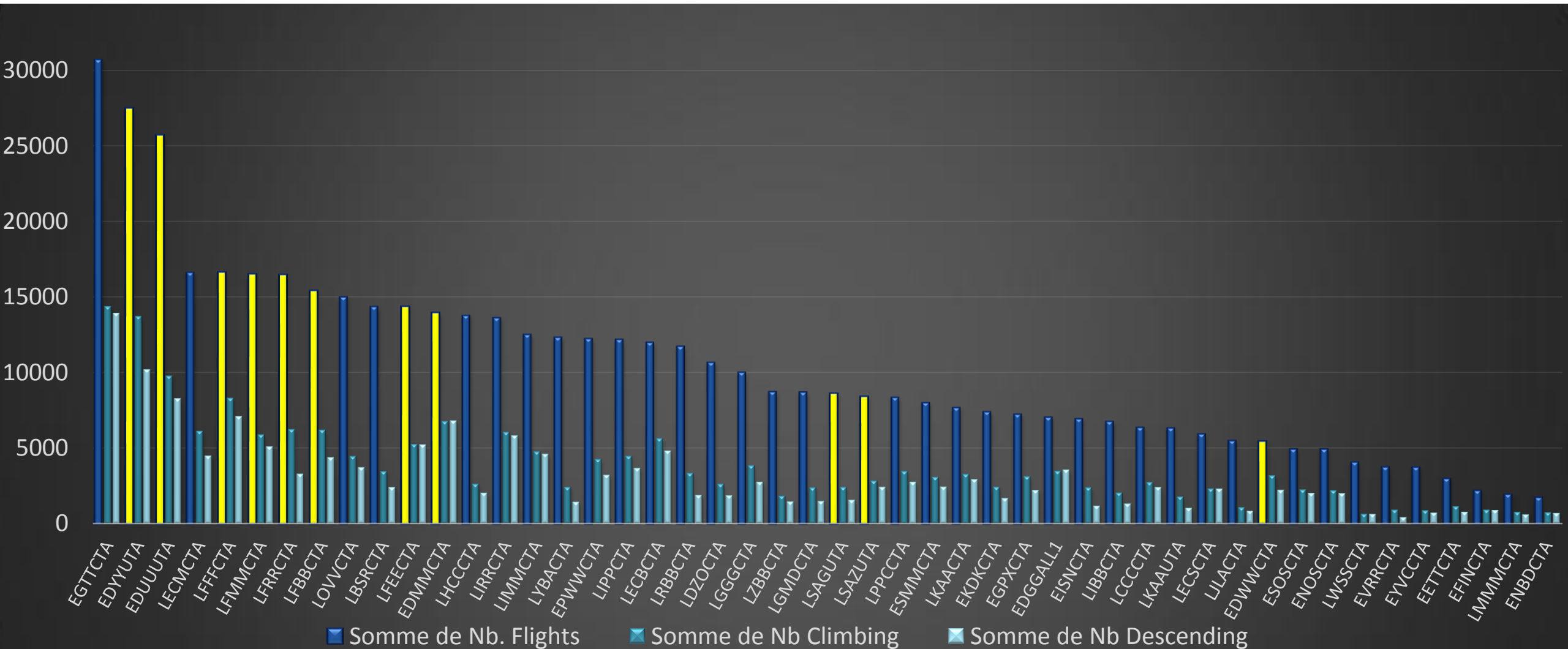
A complex context explaining some lack of efficiency



2. A complex context: Traffic distribution in En-Route airspace for week days (above FL245 only / 2nd to 6th Sept 2019)



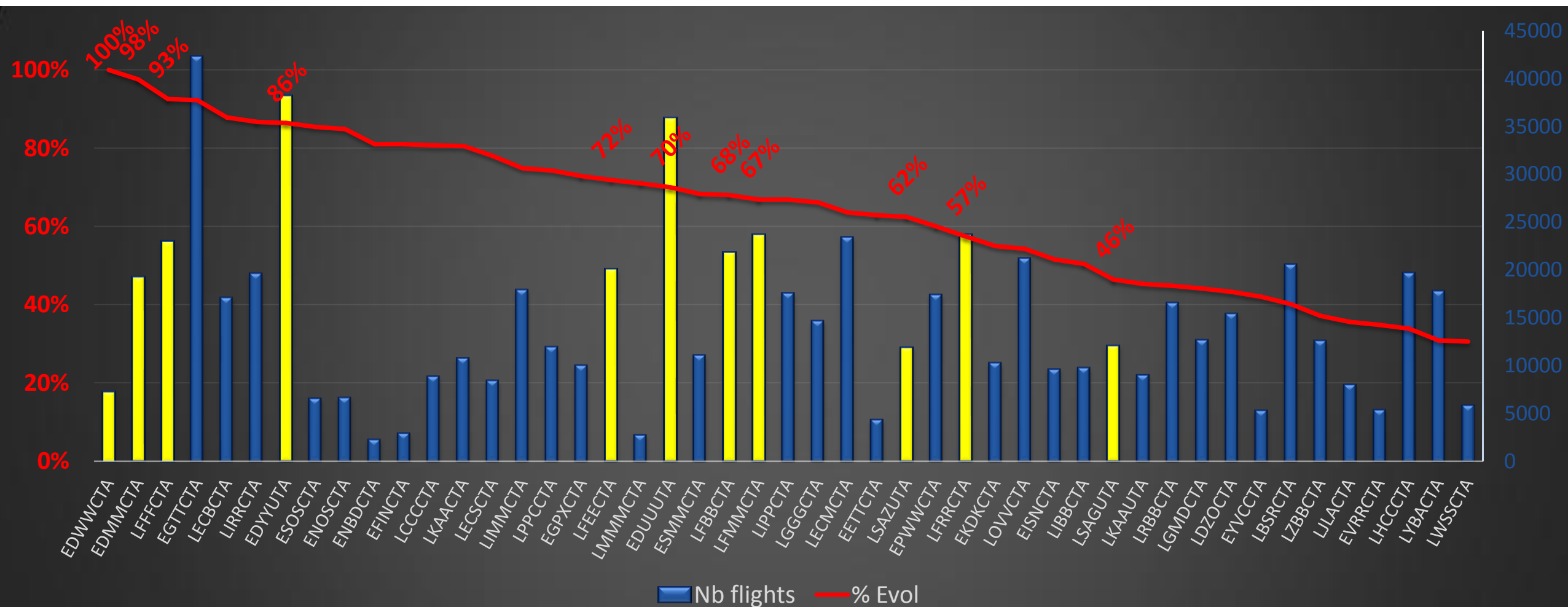
=> FABEC ACCs (in yellow) clearly the most loaded European ACCs



2. A complex context: Share of climbing/descending traffic in En-Route airspace (above FL245 only / 2nd to 8th Sept 2019)



⇒ FABEC ACCs are combining high amount of traffic and high **percentage of climbing/descending** traffic, highlighting complexity of FABEC airspace



2. ANSPs' point of view on En-route VFE

VFE performance is still impacted by the need of capacity, however...

=> ANSPs' reactivity for VFE improvement during Covid crisis

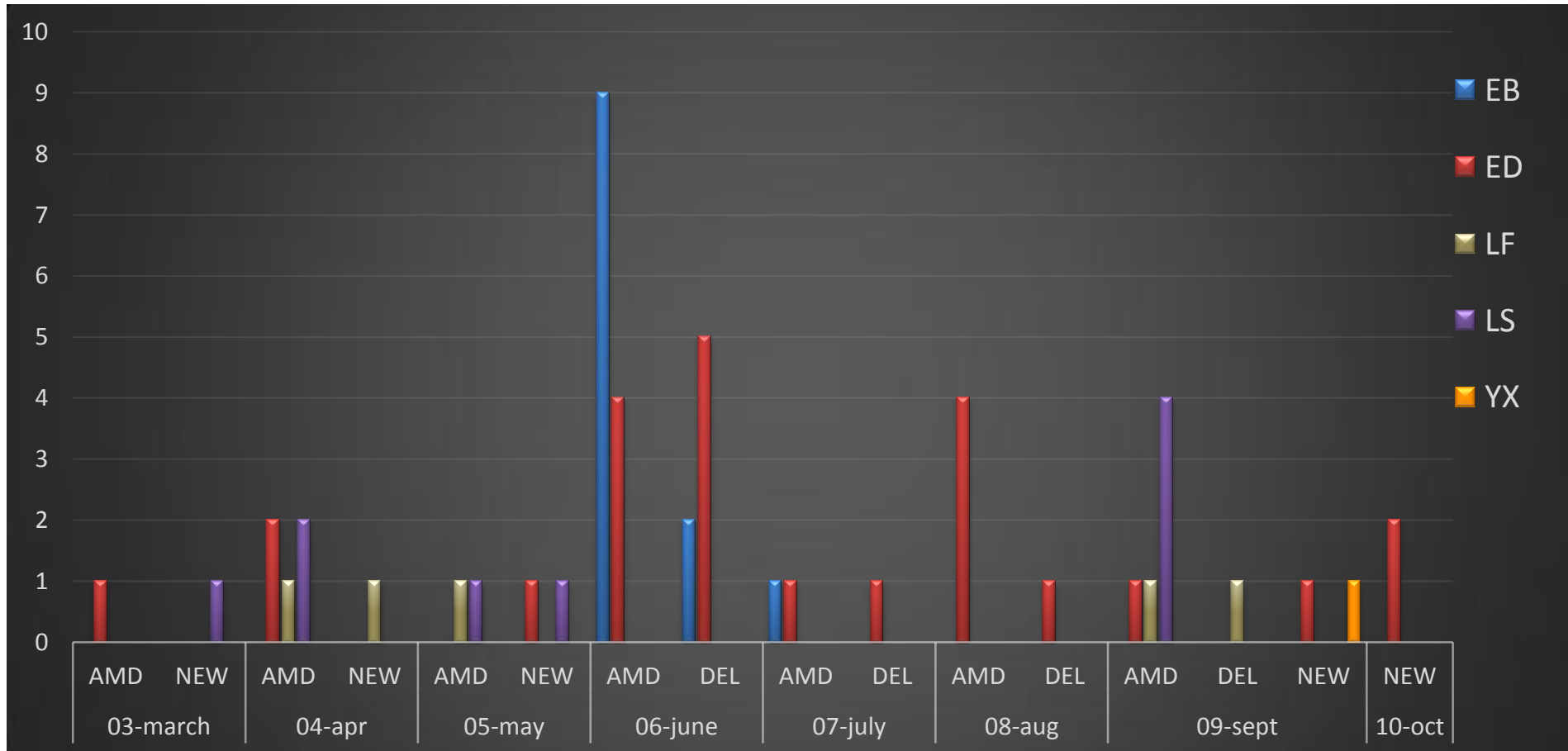
- **2164 RAD relaxation measures were taken by FABEC ANSPs between March and October 2020 (353 for App3, 777 for App4, 1034 for Pan Europe, AMD, DEL, NEW, SUSP)**
- **VFE improvements through App3 (FL capping)**
 - **Set of 253 specific Covid measures between March and October**
 - **Set of 100 non-Covid measures between March and October**

=> e.g. winter seasonal procedures applied during summer



2. ANSPs' reactivity for VFE improvement during Covid crisis

- App3: 100 non-Covid measures



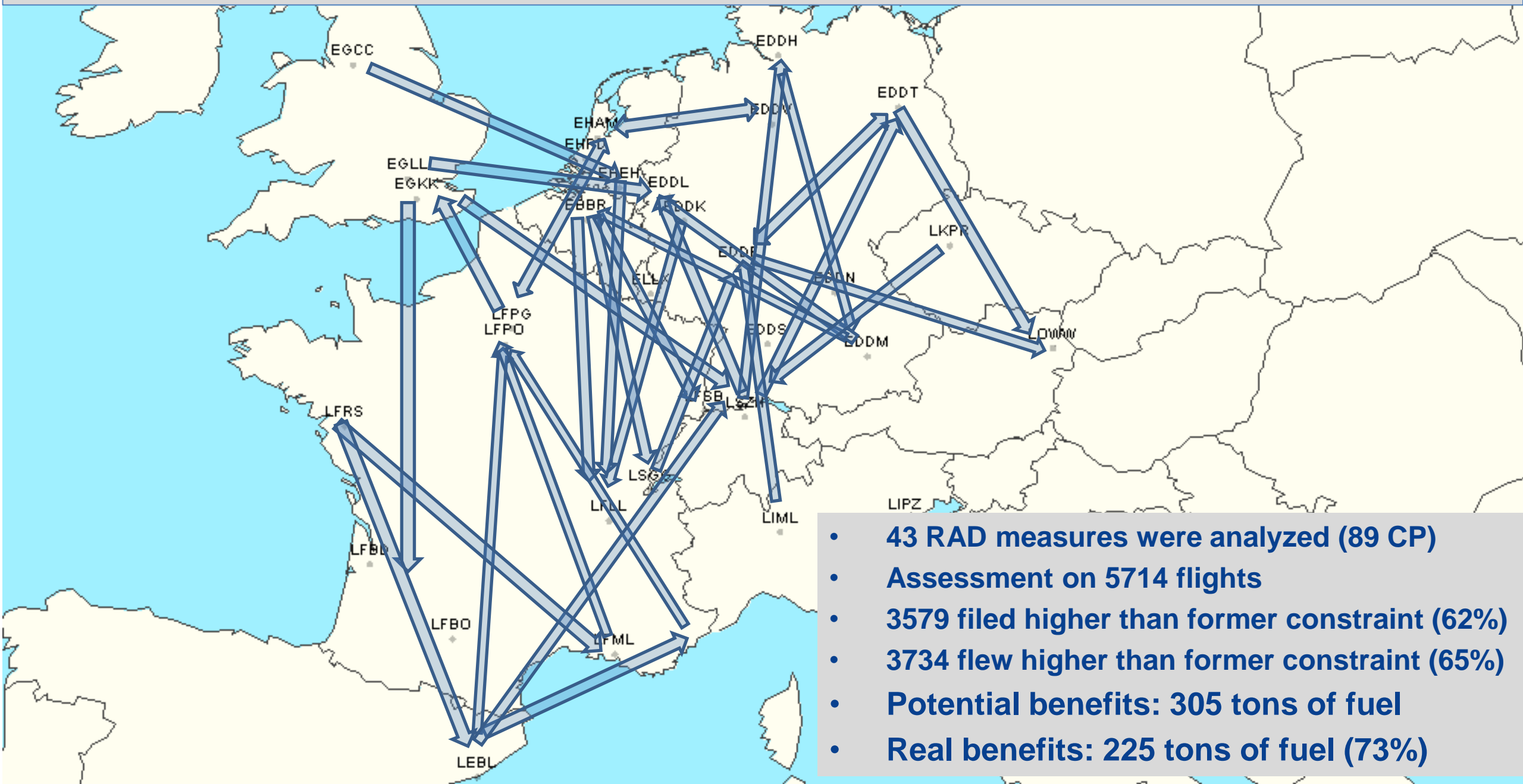
2. ANSPs' point of view on En-route VFE

Impact of RAD relaxations on En-route VFE

**Performance assessment on APP 3 (City Pairs)
(from Covid measures list)**

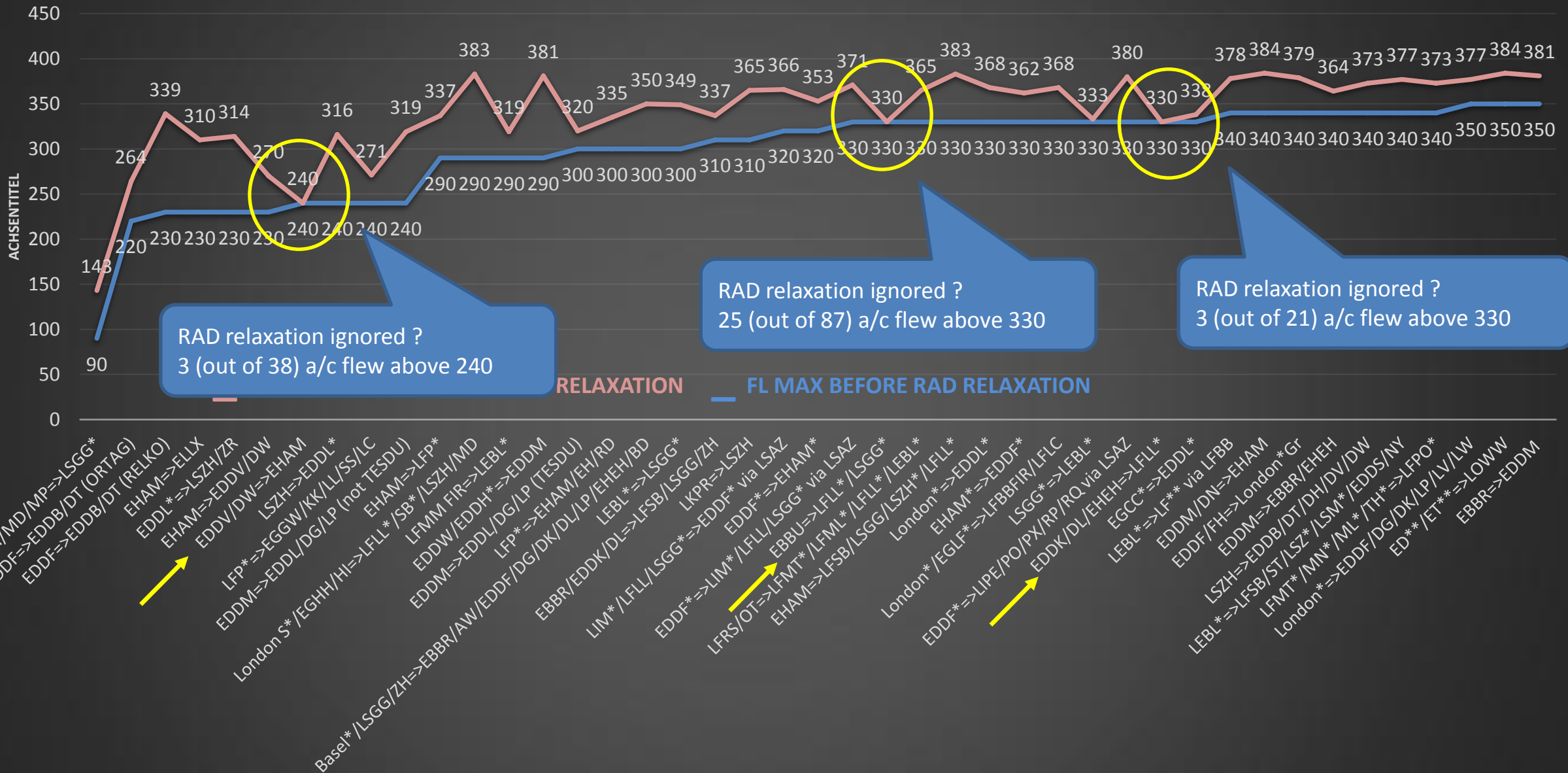


2. AIRAC 08: Covid RAD App3 relaxation / Analysed City pairs

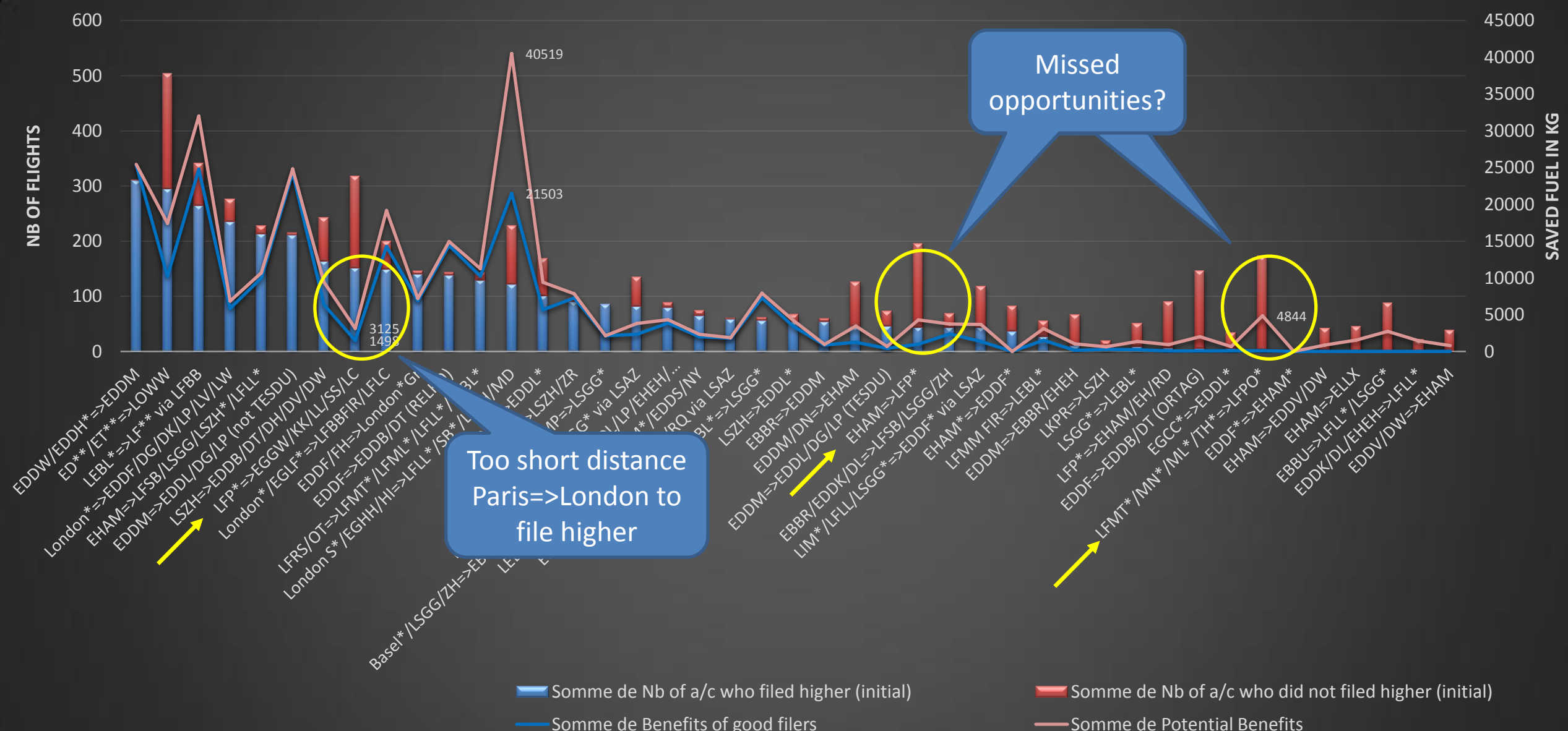


- 43 RAD measures were analyzed (89 CP)
- Assessment on 5714 flights
- 3579 filed higher than former constraint (62%)
- 3734 flew higher than former constraint (65%)
- Potential benefits: 305 tons of fuel
- Real benefits: 225 tons of fuel (73%)

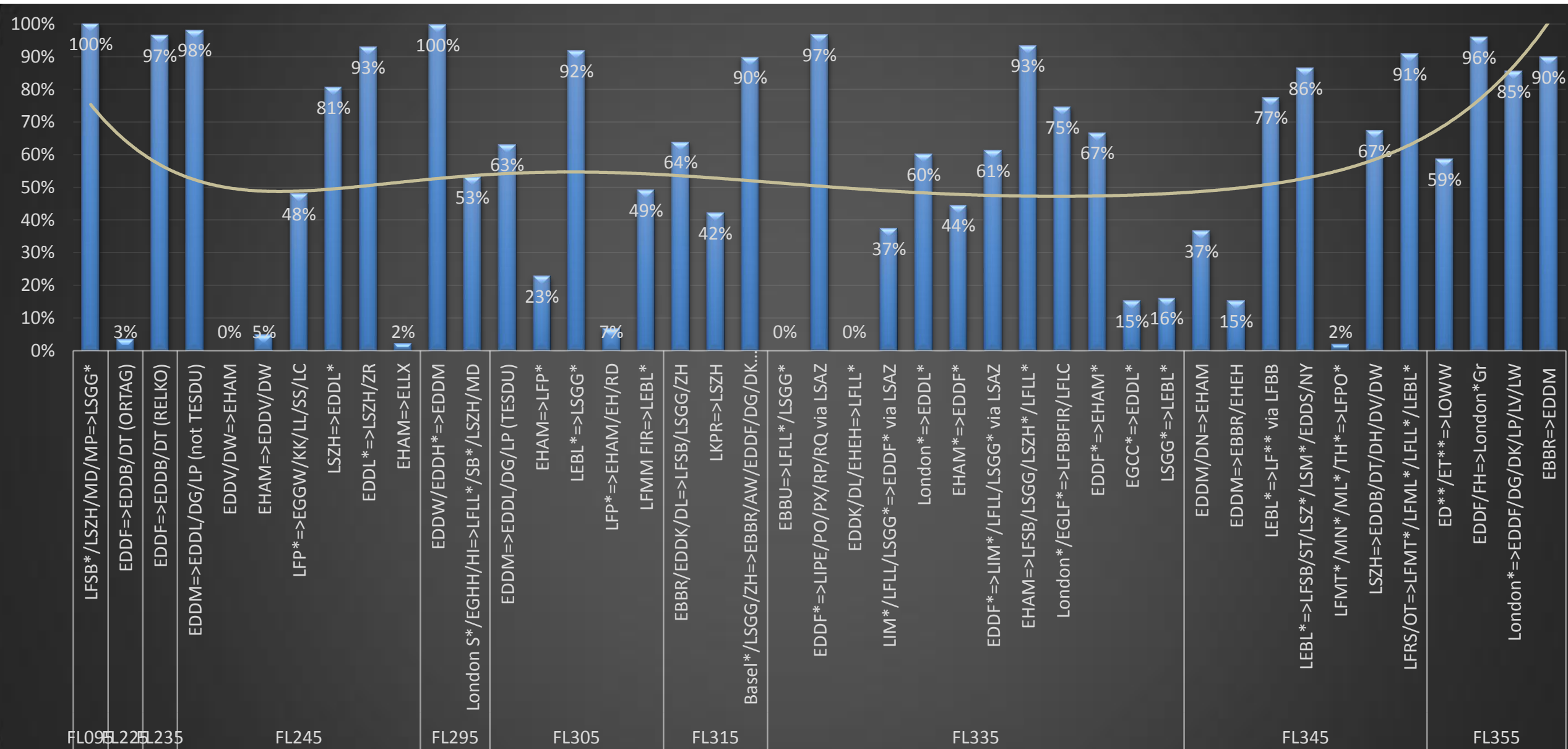
2. Average filed FL after RAD relaxation compared to FL capping before relaxation (AIRAC 08)



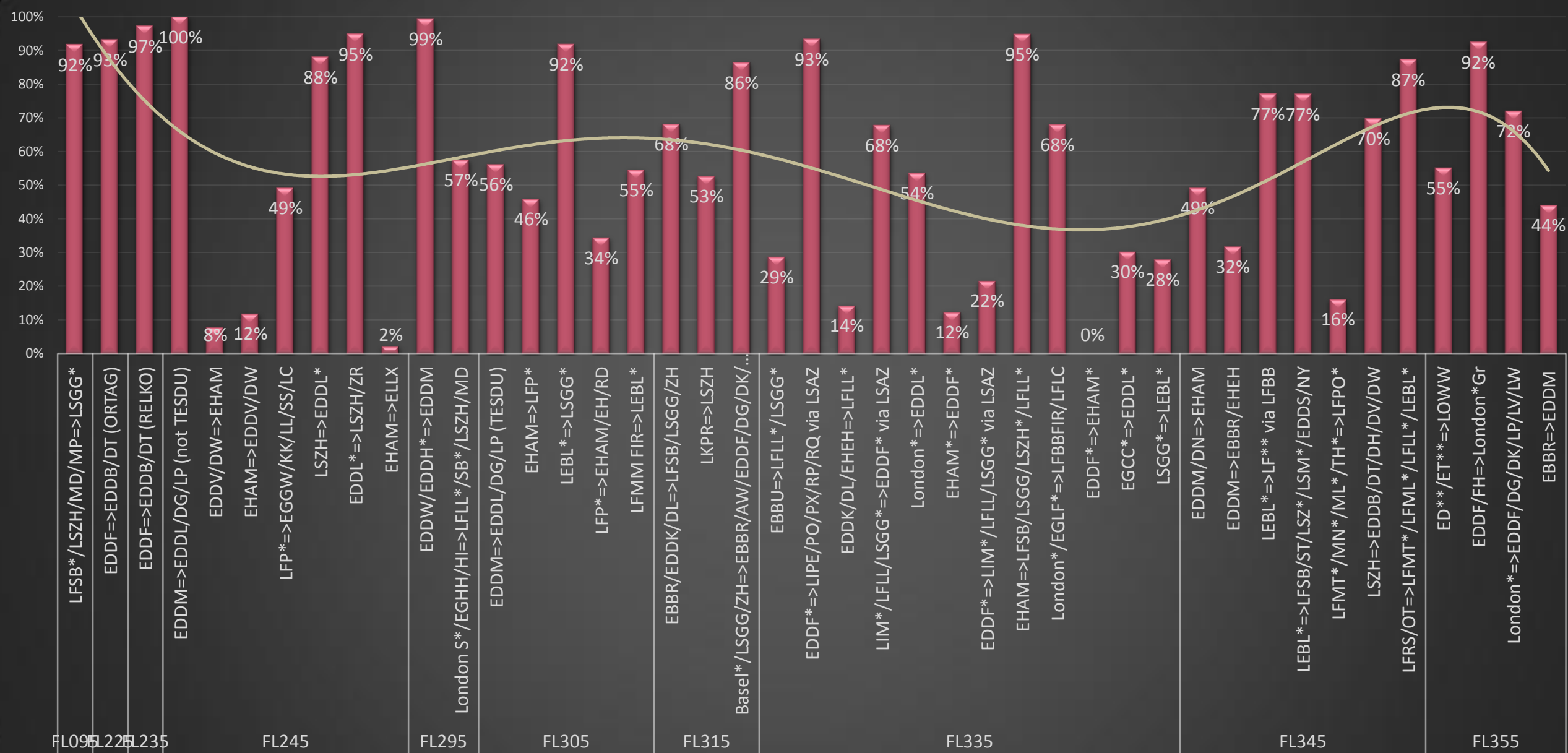
2. Benefits of filing higher (or not) / (AIRAC 08)



2. Rate of efficiency in planning after RAD relaxation



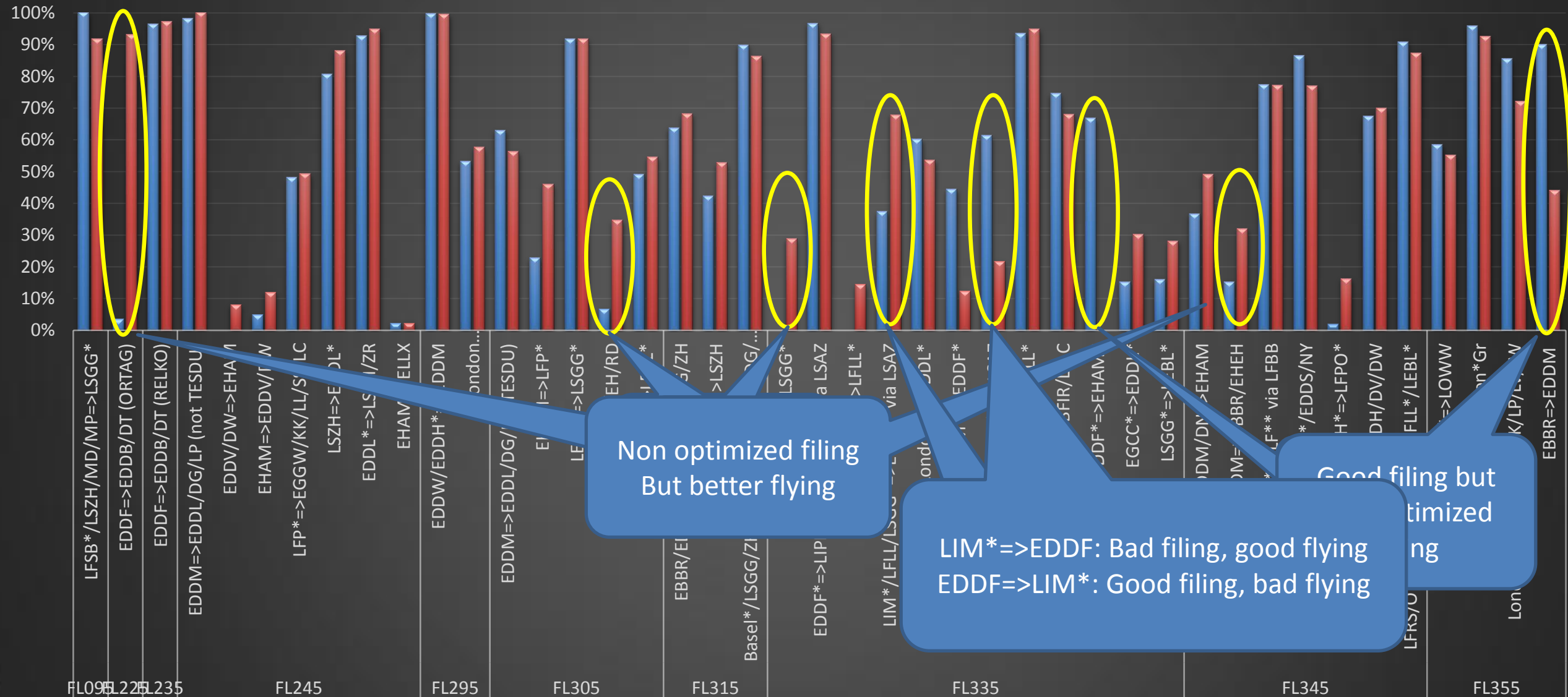
2. Rate of effective efficiency in flying after RAD relaxation FABEC



Rate of efficiency in planning and in flying after RAD relaxation



% of efficiency in planning VS % of efficiency in flying

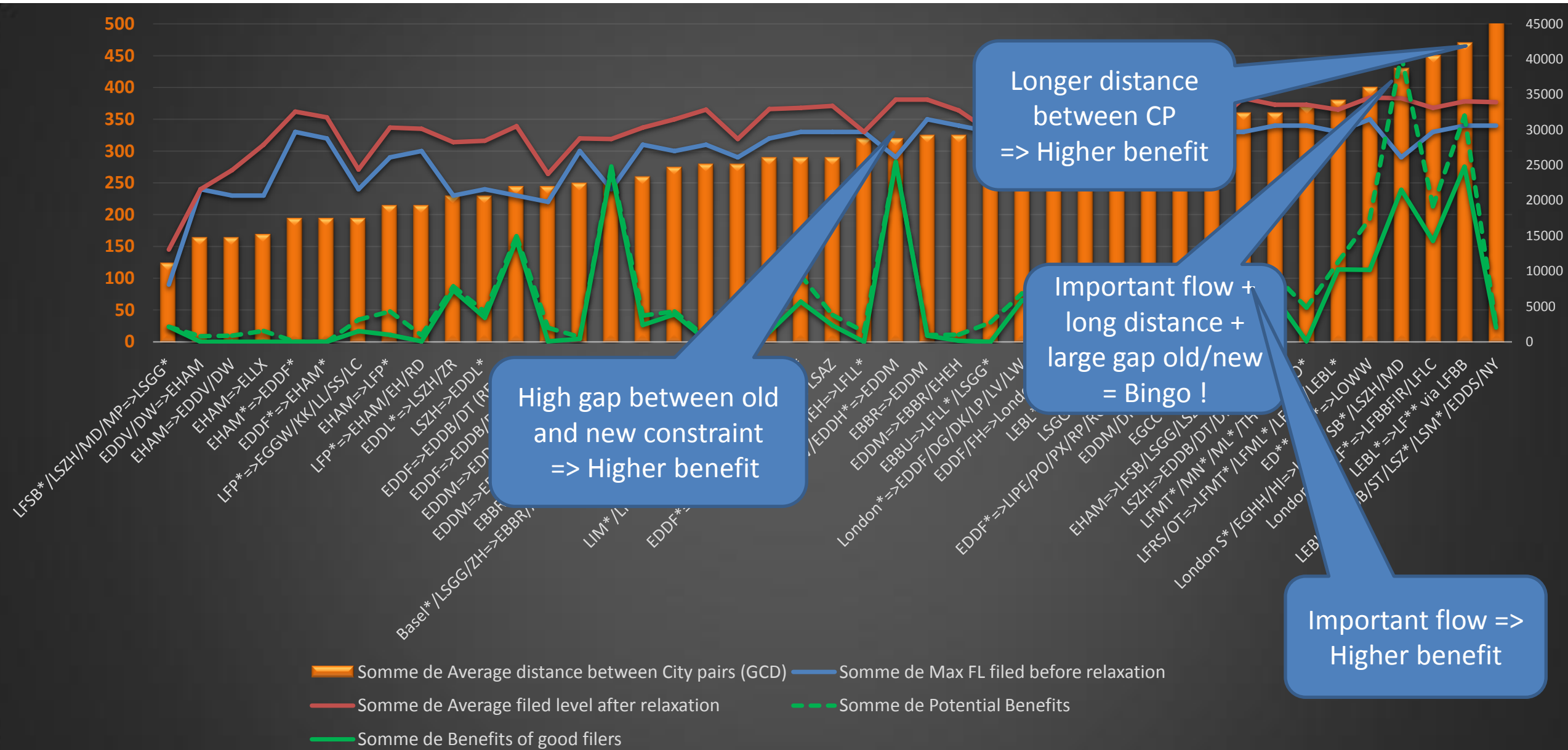


Non optimized filing
But better flying

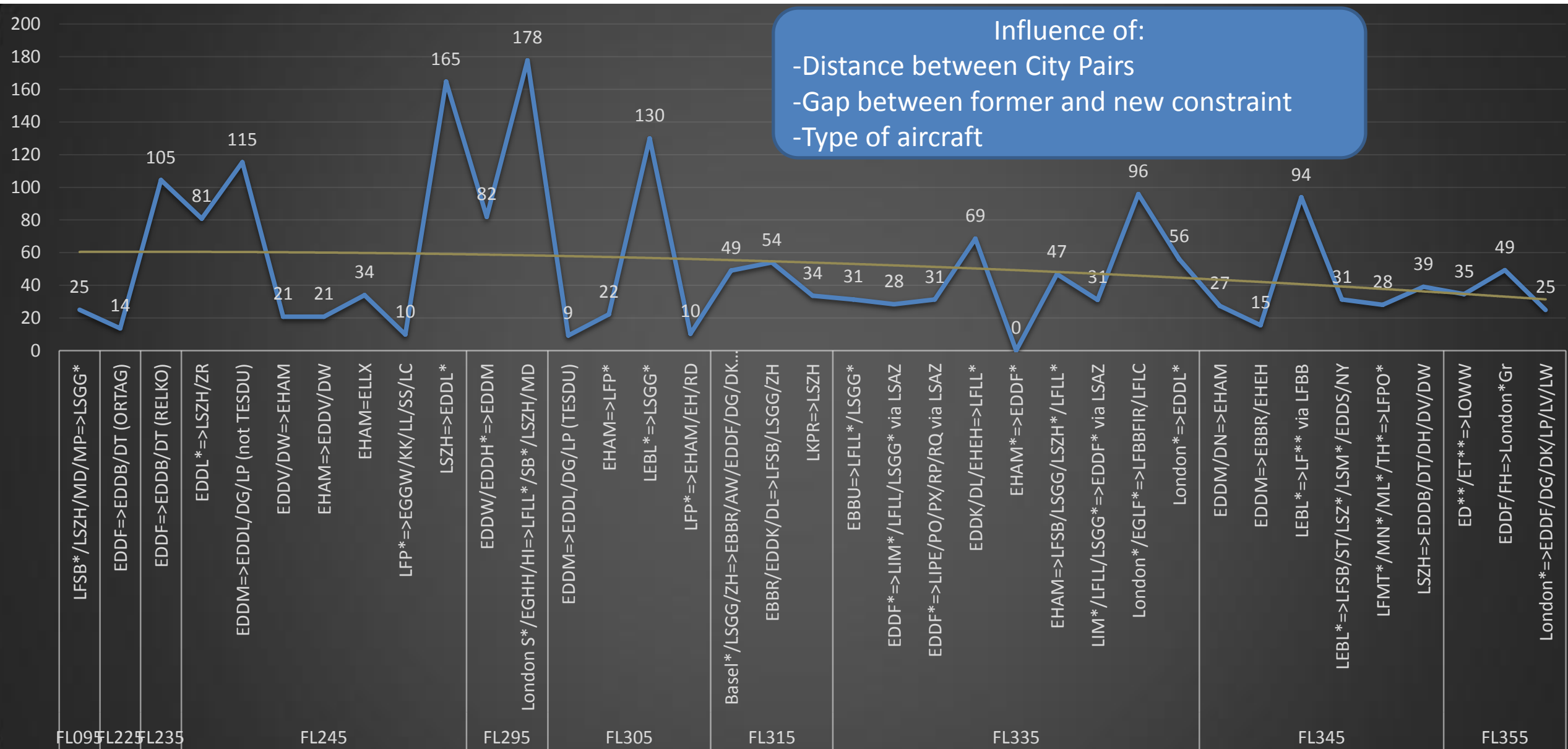
LIM*=>EDDF: Bad filing, good flying
EDDF=>LIM*: Good filing, bad flying

Good filing but
not optimized flying

2. Benefits VS average distance per CP



2. Average potential saved fuel (kg/flight) vs level capping



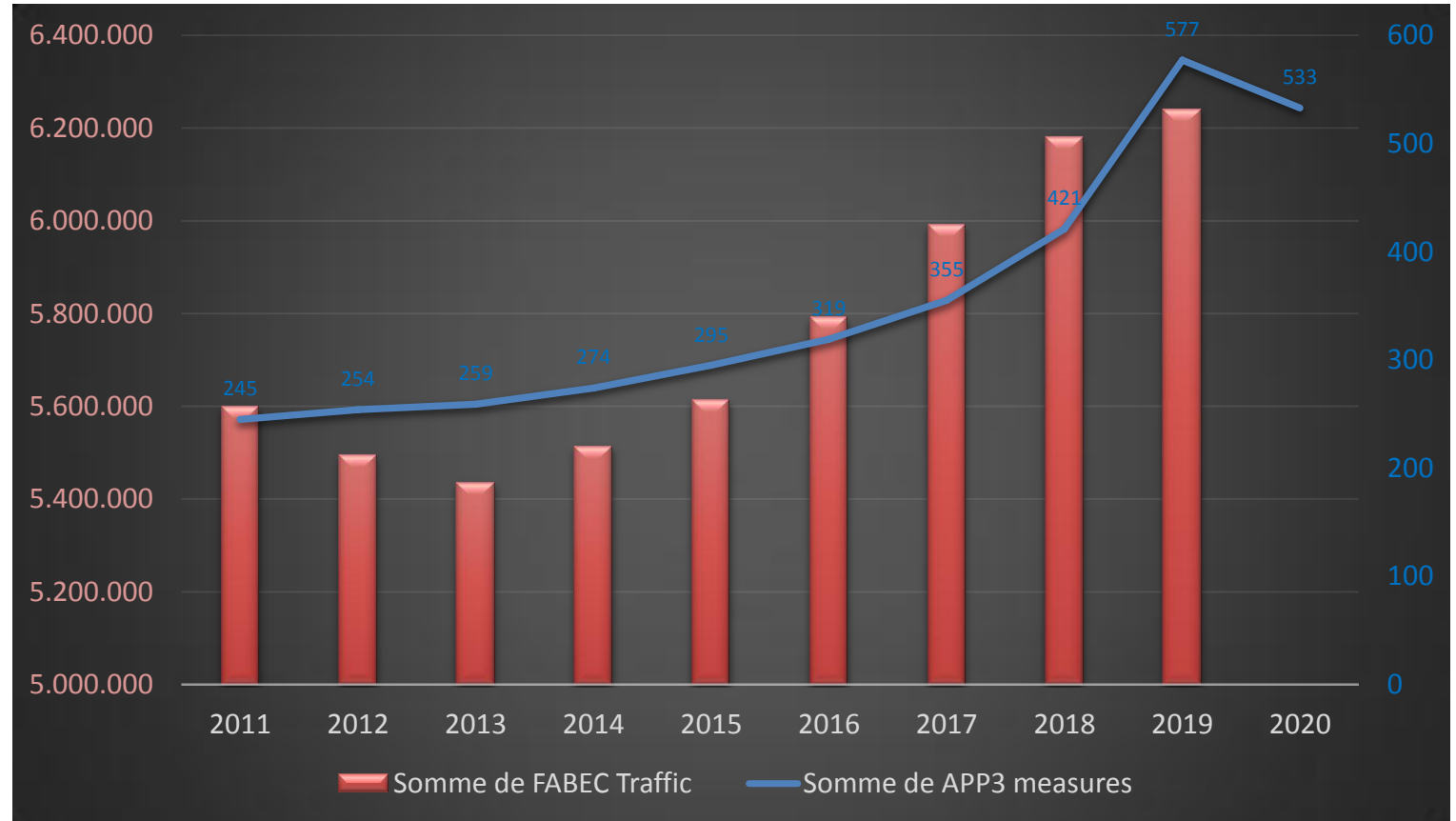
3. Interdependencies with other performance indicators



3. Interdependencies with other performance indicators

- Capacity**
 Strong link between VFE and capacity

 Priority was given to capacity, leading to an increase of VFE measures over the last 10 years



3. Interdependencies with other performance indicators

- Environment**

- **HFE is more important than VFE however ...Ex for an aircraft with FL390 as optimum FL**
- 1 hour 2000 ft below optimal (FL370) equals 0,5 min (or 4NM) of HF inefficiency on average
- 1 hour 4000 ft below optimal (FL350) equals 2,25 min (or 18NM) of HF inefficiency on average
- 1 hour 6000 ft below optimal (FL330) equals 4,75 min (or 38NM) of HF inefficiency on average
- 1 hour 8000 ft below optimal (FL310) equals 8 min (or 62NM) of HF inefficiency on average
- 1 hour 10000 ft below optimal (FL290) equals 11 min (or 88NM) of HF inefficiency on average

FL	NM/1000kg	TAS	Kg/hr	% Diff FF	1 Hr NM equivalent
390	188,4	447	2374	0%	0
370	186,9	447	2396	-0,80%	4,1
350	181,7	450	2474	-3,58%	18,19
330	174,9	454	2596	-7,17%	38,82
310	166,4	458	2750	-11,68%	62,62
290	157,4	462	2932	-16,45%	87,92



Thank you for your kind attention!