



# UPDATES OF TASK 1, 2, 3, 4 & 5

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3<sup>rd</sup> Stakeholder Meeting, Ecodesign Preparatory Study for Lifts

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## IMPORTANT NOTE ON STAKEHOLDER FEEDBACK

Please be aware that this is a draft consultation document that is only published for the purpose of receiving stakeholder comments. The underlying report may still undergo substantial revisions prior to being released as a final report of this preparatory study.

All stakeholders are invited to submit feedback using the default feedback form available in the download section of the project website at [www.eco-lifts.eu](http://www.eco-lifts.eu).

For references, please see the draft report.



## GENERAL REMARK

- All written comments from the stakeholders (based on the *Template for Comments*) sent in the context of the 2<sup>nd</sup> stakeholder meeting have been gathered and treated by the project team
  - Stakeholders asked for more transparency of the process
- ➔ Overview of the comments and on the way the project team dealt with them was sent to the registered stakeholders on 14<sup>th</sup> February (see invitation to the stakeholder meeting 3)
- main comments / updates are presented here

# GENERAL COMMENTS

## Main comments and changes

Nr	Institution	Comments	Proposed change	Observations of the project team and update in the task reports
300	ELA	Both reports base to a high degree on the E4 study. These figures as well as the technologies described are mainly focusing on existing stock. Without a updated analysis (update E4 or new study) on the currently used technologies and its ecological impacts it will be difficult to anticipate future improvement potential		It is out of the scope of this study to update the E4 study. The basecases have been adapted according to the comments received by stakeholders and reflect current average new installations.
350	ECOS	There are several aspects which are not yet fully addressed in the preparatory study.	<p>We encourage the study team to address the below described issues.</p> <ul style="list-style-type: none"> <li>- Base cases 1 to 4 are too narrow. We recommend to include higher (housing, commercial) buildings (up to 100 m with 30 stories), higher speed up to 10 m/s.</li> <li>- The cabin weight is not addressed (lightweight materials, well balanced with counterweight)</li> <li>- The standby energy use is crucial: all elements need to be addressed: <ul style="list-style-type: none"> <li>- Lighting inside and outside of car</li> <li>- Controls</li> <li>- VFD controls</li> <li>- Safety features</li> <li>- Doors</li> <li>- Ventilation, heating/cooling inside of car</li> </ul> </li> <li>- In multiple well lifts, the control system needs to be addressed: intelligent call system, car cancellation options, etc. to minimize empty rides</li> <li>- The total Energy Balance of the lift is not explained and analysed</li> <li>- Auxiliary cooling of motors with external fans are needed in case they are operated with VFD</li> <li>- Cooling of car in hot climates is not addressed</li> <li>- Elevators in exterior spaces are not addressed</li> <li>- Thermal loss of well through convection and ventilation is not addressed.<sup>1</sup></li> </ul> <p>Footnote 1: There is a Swiss recommendation on this by <a href="http://www.endk.ch">www.endk.ch</a></p>	Info: The aspects will be adressed in Task 5, 6 and 7
368	ECOS	More elements could be considered to determine and improve the energy efficiency of lifts.	<p>In view of the upcoming tasks, we encourage the study team to look at the proposed elements to determine and improve the energy efficiency of lifts.</p> <ul style="list-style-type: none"> <li>- Use of advanced control system to minimise long and empty runs</li> <li>- Minimal optimized overall system efficiency of motor driven unit: motor, gear, VFD, brake, controls, etc.</li> <li>- Limit to max. Total Standby</li> <li>- Speed limit (m/s) depending on building height</li> </ul>	Design options are part of task 6

# TASK 1: UPDATE

## Main comments and changes

Nr	Institution	Line number	Comments	Proposed change	Observations of the project team and update in the task reports
2	Hydroware	301	Interpretation of this clause differs from country to country.	Include here a reference to the new Guide Line for the Directive 2014/33/EU, § 37 where it is clarified what is a major change of an existing lift which means it will fall under the directive for a new lift.	Accepted, see new footnote refereing to the Guideline of May 2018
3	Hydroware	510	It is true that the functional unit in the PCR is t.km but this must be changed in the next revision of the PCR.	When evaluating the environmental impact of a lift the life time of the building must be considered. That is a complete lift has no life time but the different components of a lift have different life times that must be considered.	Info. See new footnote
351	ECOS	282	<p>The study should discuss what exemptions of the Lift Directive can have potential significant environmental impact and should be included in the scope of the study.</p> <p>For instance, the exclusion of lift appliances whose speed is not greater than 0.15m/s automatically excludes products like home lifts from the scope. The study team claims that "statistics about these products are poor and that the energy consumption of those appliances is usually smaller than that of the higher speed products."</p>	<p>Consider what proposed exemptions have significant environmental impact and should be included in the scope.</p> <p>We invite the study team to at least provide data and figures of the aggregated energy consumption of all the lift appliances whose speed is not greater than 0.15m/s (taking into consideration not only the energy consumption per appliance, but the overall energy consumption of these products in the market, and the market share of these type of product), to allow for more informed decisions later in the process...</p>	Rejected. Only few data could be found for lifts appliances whose speed is < 0.15 m/s Product standard and framework are different than for lifts

# TASK 1: UPDATE

## Main comments and changes

Nr	Institution	Line number	Comments	Proposed change	Observations of the project team and update in the task reports
352	ECOS	54	In terms of calculating the energy consumption of the lift, the primary parameters differ from the ones proposed in Task 1. We invite the study team to reassess the primary and secondary parameters identified.	<p>The following parameters' data would be required to allow for the calculation of the energy consumption of the lift:</p> <ul style="list-style-type: none"> <li>- Standby</li> <li>- Control losses</li> <li>- Auxiliaries (lighting, doors, fans, cooling, etc.)</li> <li>- Gross weight of car (incl. avg. load)</li> <li>- Gross weight of counterweight</li> <li>- Friction losses of cables and pulleys</li> <li>- Necessary acceleration power (depending on speed and weight)</li> <li>- Necessary vertical lift power (depending on weight difference between cabin, load and counter weight and required top speed)</li> <li>- Air resistance in well</li> <li>- Optimum travel distance with advanced control system</li> </ul>	Rejected: energy consumption has not to be linked to primary and secondary parameters
353	ECOS	594	The lack of European standards addressing the energy efficiency of lifts should in no case be a deterrent to assessing, proposing and eventually adopting legislative requirements.	We encourage the preparatory study team to include a recommendation for the Commission to eventually issue a Standardisation Request to the ESOs to address energy efficiency of lifts under Ecodesign.	ISO 25745 is already an EN standard

## TASK 2: UPDATE

### *Main comments and changes*

- Version 3 changes in the report:
  - Electricity prices PRIMES
  - Stock data with residential and non-residential aggregated

## TASK 2: UPDATE

### *Main comments and changes*

Nr	Institution	Line/Question	Comments	Proposed change	Observations project team
1	Hydroware	Task 2 - line 400	It can not be true that there should only be 15 000 out of 2 850 000 residential lifts that are in user category 1. On all residential buildings up to 6 floors we have measured in Sweden all of them are cat. 1	Perform a new survey because the usage category has a huge impact on what kind of lift that has the least environmental impact	As stated in the document, the lift stock in 2009 categorized by sector and usage categories according to ISO 25745-2 is not available. The numbers in the table were derived from the lift stock per sector data available from the E4 Project. This is thus only an indicative distribution using the E4 Project data. The numbers cannot be seen as the total number of existent lifts per sector in the several user categories. The values in that table used the number of trips per year available in the E4 to calculate the average number of trips per day and consequently the usage categories for the year 2009. The final stock model also considers data from ELCA and ELA and not only from the E4 Project. If needed, a sensitivity analysis can be conducted.

## TASK 2: UPDATE

### *Main comments and changes – comments on task 7, related to task2*

Nr	Institution	Line/ Question	Comments	Proposed change	Observations project team
39	ELA	Task 7 - line 322	Almost doubling of lift sales by 2025 as reported 224 093 lifts/year is completely unrealistic	Verify and correct the assumptions of scenario, provide information source	The calculations of the sales are in task 2, table 2-14. The scenario starts from the assumption that the renovation target of 3% put forward in the EPBD will be reached. It is a renovation target for buildings, not for lifts. On top of this two trends to retrofit more lifts in the future are observed: <ul style="list-style-type: none"> <li>- Accessibility aged population and</li> <li>- Fire safety evacuation for disabled persons in public buildings.</li> </ul>
74	ELA	Task 7 – line 777-780	An “accelerated renovation scenario” leads to higher sales due to higher replacement but not to “accelerated increase in stock” as the real new installations (stock growth) remains as the normal level.	The scenario needs to be reconsidered.  In consequence Figure 7-18 and Table 7-13 may need to be adapted	The accelerated renovation scenario is a renovation scenario for buildings, not only lifts. Some of the older buildings do not have a lift and the scenario assumes that a lift will be placed during renovation.
86	KONE	Question 7-2	It's more fair and relevant considering the average margin of TOP4 companies as in Task report 2 (Market)	Consider the average margin from the largest European elevator manufacturers.	Annual reports of Thyssenkrupp and Schindler are available on their website. The project team will check if the reports contain the necessary information.

### General objectives of Task 4:

- This task is a general technical analysis of current products on the EU market
- It provides general inputs for the definition of the Base-Cases (Task 5) as well as the identification of the improvement potential (Task 6), i.e. the part that relates to the best performance products - BAT (Best Available Technology) and BNAT (Best Not yet Available Technology).

Main changes in response to stakeholders comments on 1<sup>st</sup> draft:

- Removed description of older technologies;
- Revised the technology description
- Updated references to outdated standards
- Updated the definition of BaseCases
- Updated Bill-of-Materials accordingly
- New section on Best Not yet Available Technologies
- Added section 4.3 Recommendations

## TASK 4 – TECHNOLOGIES

### *New Basecase definition*

Base Case ID	BaseCase 1A	BaseCase 1B	BaseCase 2A	BaseCase 2B	BaseCase 3	BaseCase 4
Type	traction	hydraulic	traction	hydraulic	traction	traction
Rated load in [kg]	450	450	630	630	1000	1250
Rise [m]	12	12	12	12	21	30
Number of floors [-]	4	4	4	4	7	10
Nominal speed [m/s]	1	0,63	1	0.63	1	1.6
Acceleration [m/s <sup>2</sup> ]	0.5	0.5	0.5	0.5	0.5	0.5
Jerk	1	1	1	1	1	1
Roping	2:1	n.a.	2:1	n.a.	2:1	2:1
Usage Category	1	1	2	2	3	4
Daily trips [-]	50	50	125	125	300	750
Average travel distance [%]	49%	49%	49%	49%	49%	44%
Average car load [%]	7.5%	7,5%	7.5%	7.5%	4.5%	6.0%
Counterbalancing [%]	50.0%		50.0%	-	50.0%	50.0%
Number of operating days per year [d/a]	360	360	360	360	360	360
Designed service life [a]	25	25	25	25	25	25
FU [tkm]	89.3	64	312.6	312.6	1250.2	6682.5

## TASK 4 - TECHNOLOGIES

### *Assumptions for the energy consumption of BaseCase lifts*

<b>E_standby</b>							
P_id [W]	power use in idle mode	120.00	120.00	160.00	160.00	180.00	200.00
P_st5 [W]	standby power used after 5 min	120.00	120.00	160.00	160.00	180.00	200.00
P_st30 [W]	standby power used after 30 min	120.00	120.00	160.00	160.00	180.00	200.00
t_d [s]	time for the opening, opened and closing times of the lift doors	10.00	10.00	10.00	10.00	10.00	10.00
a [m/s <sup>2</sup> ]	average acceleration	0.50	0.50	0.50	0.50	0.50	0.50
J [m/s <sup>3</sup> ]	average jerk	0.80	0.80	0.80	0.80	0.80	0.80
<b>E_travel</b>							
Erc [Wh]	running energy of reference cycle according to ISO 25745-1	19.8	36.8	27.6	51.5	76.6	132

## TASK 5: UPDATE

### *Main comments and changes*

- Main changes:
  - Base-Case definition
  - Energy calculation for Base-Cases
  - Bill of Materials for Base-Cases
  - Updated tables with replacement rates
  - Updated LCA calculations
  - Updated LCC calculations, updated prices (electricity price) and discount rate of 4% (no escalation rate)

## TASK 5: UPDATE

### *Main comments and changes*

- Update on replacements:
  - Car and landing doors not replaced
  - Controller: only replacement of electronics
  - Replacement of ropes from 1 to 3 times depending on the Base-Case
- Alignment of number of inspection visits between LCA and LCC
- Volume of packaging adapted (relevant for distribution phase)

## TASK 5: UPDATE

### *Main comments and changes*

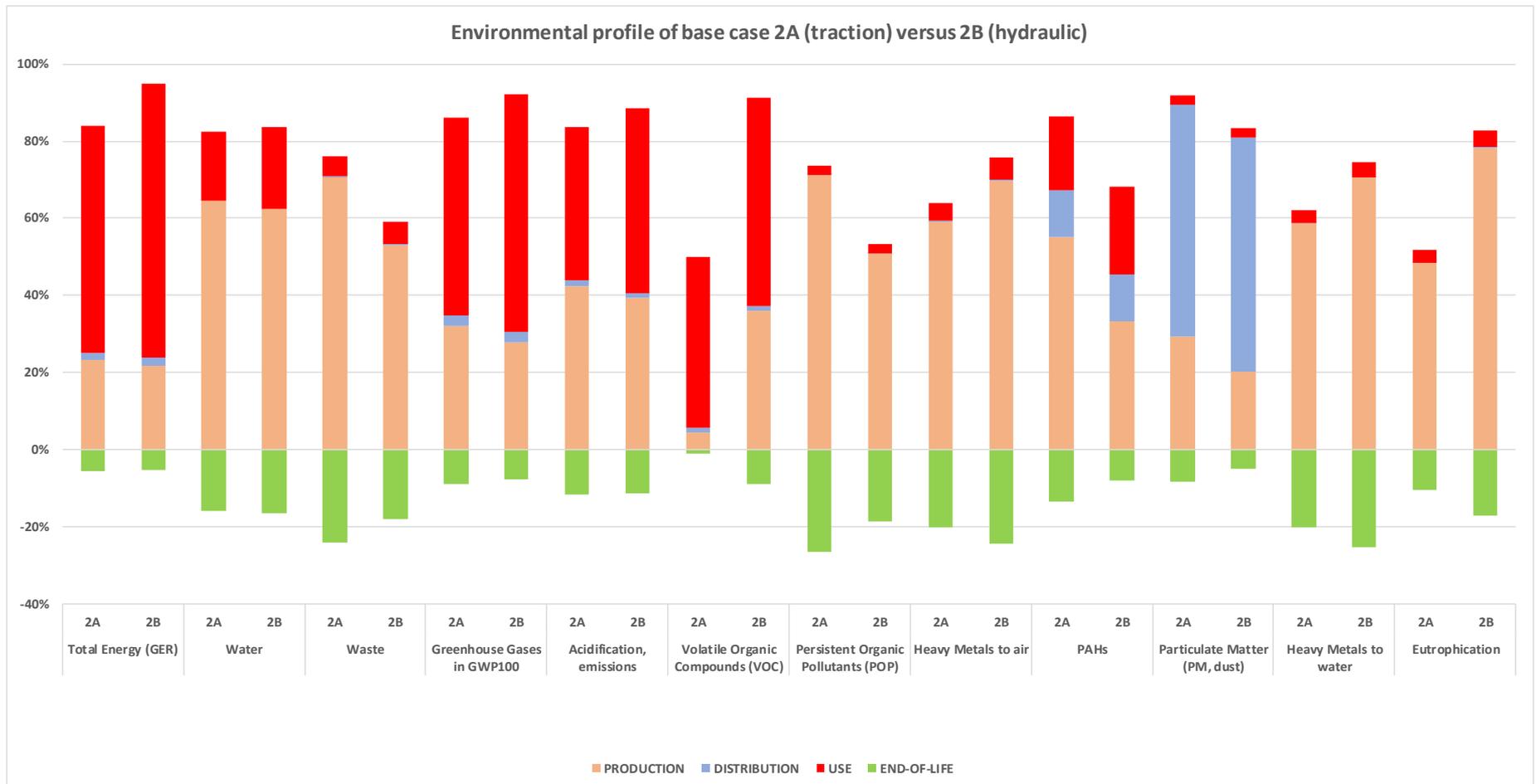
- Not accepted stakeholder comments:
  - Comments on life span: 25 years are kept for LCA and LCC calculations in task 5 (in line with PCR for lifts)
  - Only new lifts are considered
  - Reference year remained 2015
  - Batteries and UPS not included: considered in UPS study
  - Change of oil: 2 times



# TASK 5: UPDATE

## Main comments and changes

- Updated LCA result Base-Case 2A and 2B



- General conclusions remain the same:
  
- LCA:
  - Rather small difference between hydraulic and traction lifts
  - Use phase is most important in the energy related impact categories, acidification and VOC.
  - The production phase is most important in the other impact categories, except for particulate matter where distribution is most important
  
- LCC:
  - Previous calculations used an escalation rate of 4%. This is not taken into account in the current version and leads to a lower overall life cycle costs (net present value).

**THANK YOUR FOR YOUR ATTENTION**

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