



Energy saving ideas

*„If you cannot do great things, do
small things in a great way.“*

József Csibra

10.05.2023

Agenda



- Introduction of the company 5'
- Our Green Spirit program 5'
- Green Spirit in practice 5'
- Case study 1 - The coffee machine 10'
- Case study 2 - External lighting
- Case study 3 - Extrusion line
- Panel discussion - Downtime management 10'
- Summary, Q&A 5'

Who we are



Electrolux Group is a leading global appliance company that has shaped living for the better for more than 100 years. We reinvent taste, care and wellbeing experiences for millions of people, always striving to be at the forefront of sustainability in society through our solutions and operations. Our main strategic drivers are to act sustainably, create better experiences and always improve!

135

billion SEK in sales

120

markets reached

60

million products
sold annually

51,000

employees

Consumer experience innovation in three focus areas



Taste

The offering includes cookers, hobs, ovens, hoods, microwave ovens, refrigerators, freezers, and small appliances for cooking.



Care

The offering includes washing machines, tumble dryers, dishwashers and small appliances for fabric care, such as irons.



Wellbeing

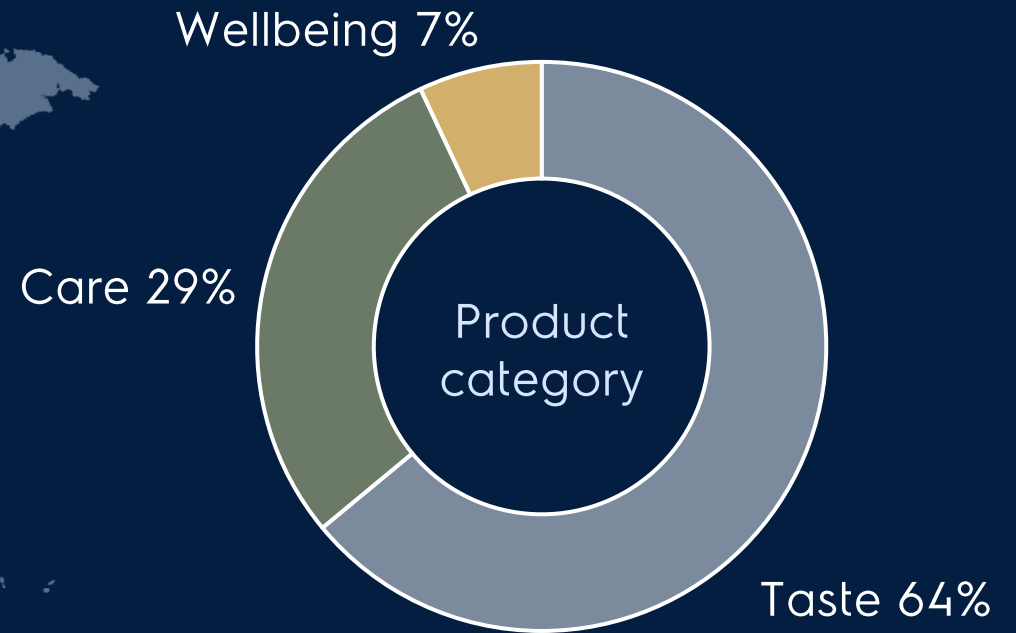
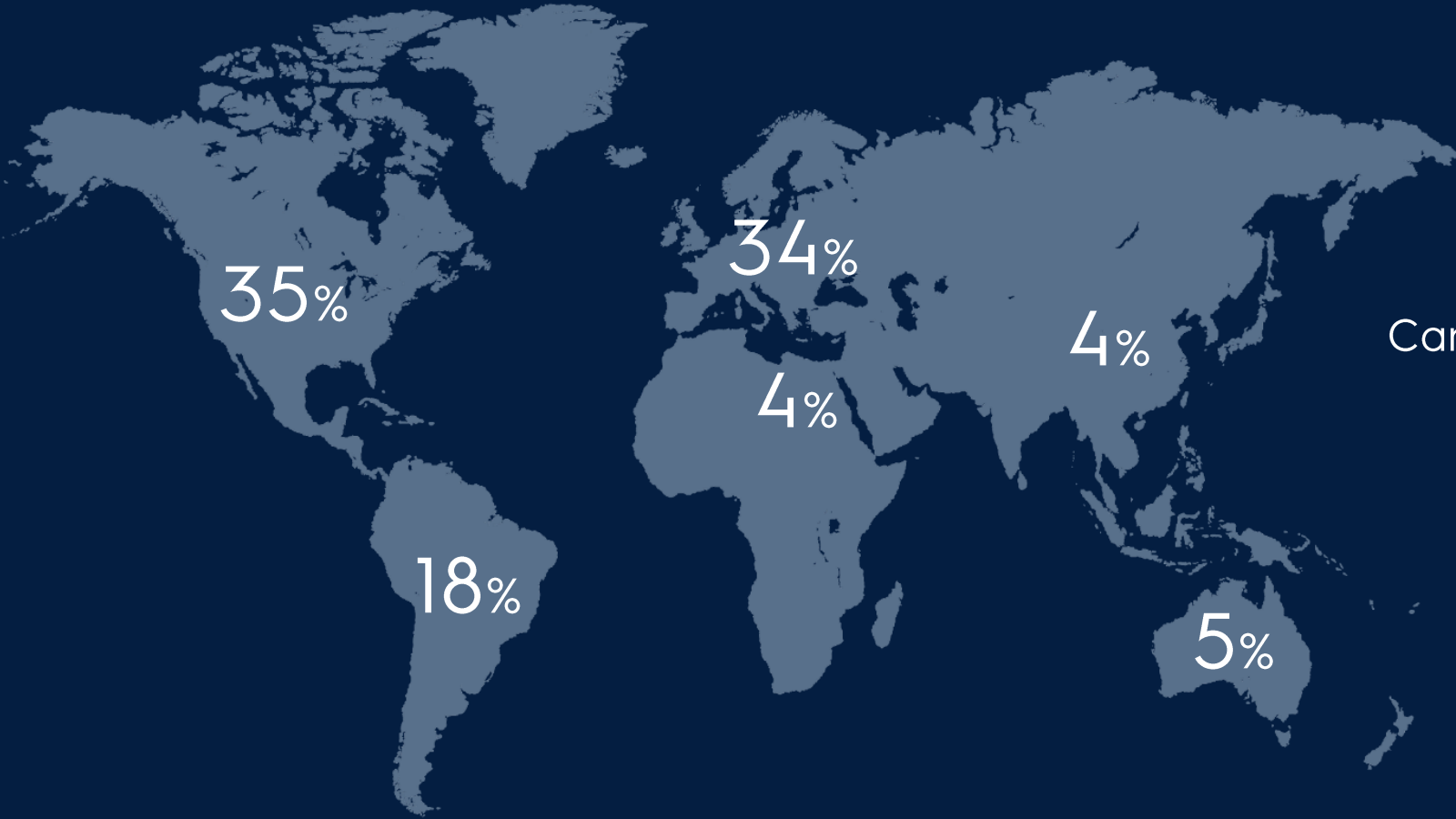
The offering includes vacuum cleaners, air conditioning equipment, water heaters and heat pumps.



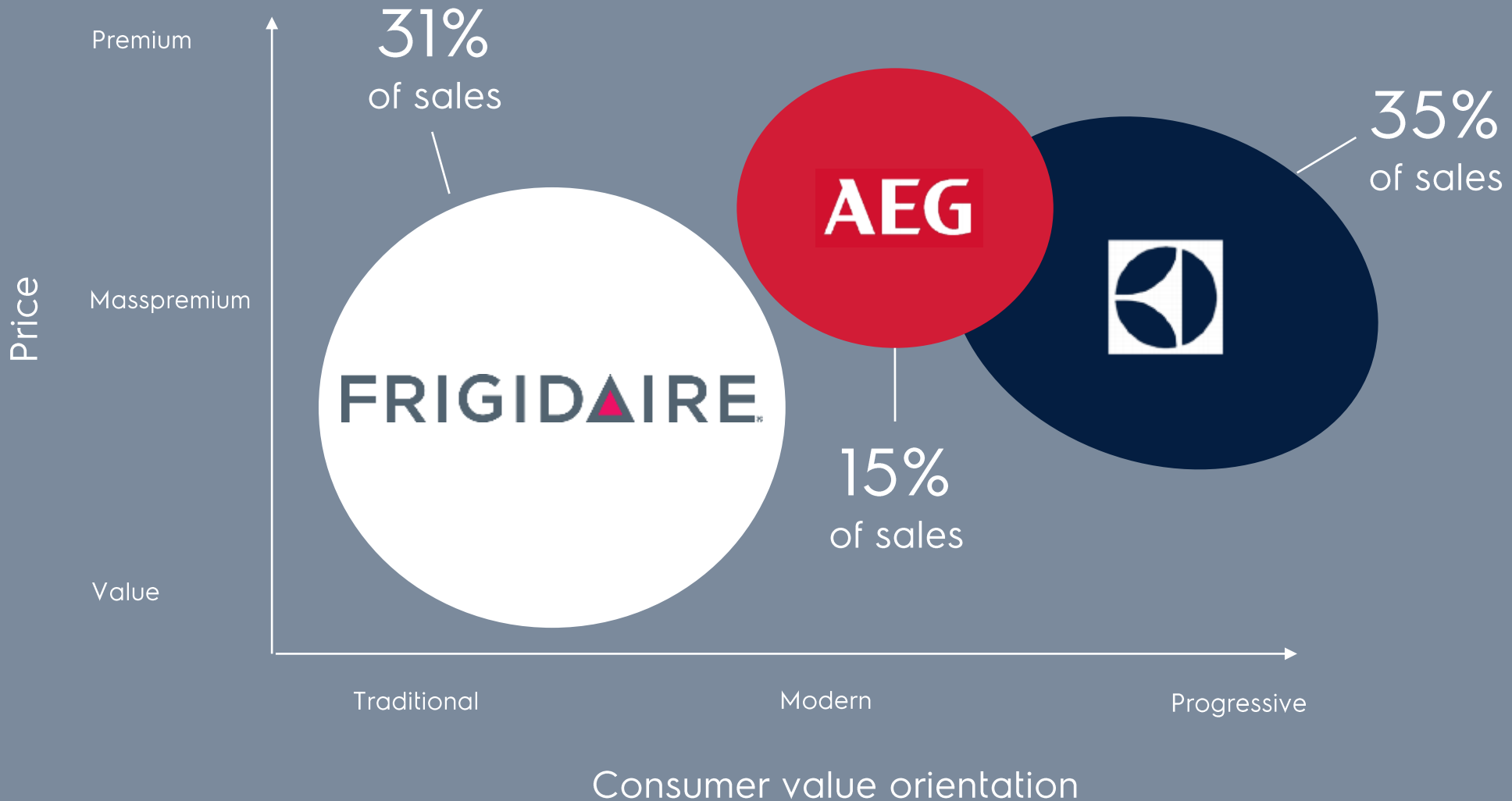
Electrolux Group sales per region and category



Sales by region 2022



Three main brands with distinctive target consumers



One of the most sustainable companies in the world



For the Better 2030

toward climate neutrality and circularity



Better Company

Be climate neutral and drive clean, resource-efficient operations

Act ethically, lead in diversity and respect human rights

Drive supply chain sustainability



Better Solutions

Lead in energy- and resource-efficient solutions

Offer circular solutions and business models

Eliminate harmful materials



Better Living

Make healthy and sustainable eating the preferred choice

Make clothes last twice as long with half of the environmental impact

Make the home a healthier place to thrive in, with half the carbon footprint

Supporting the UN Sustainable Development Goals and our Climate Targets

For the Better

Key results 2022



Better Company

98%

of electricity used in global operations from renewable sources.



Better Solutions

24/39

Our most energy and water-efficient products accounted for 24% of total units sold and 39% of gross profit.



Better Living

**Fridge with Cooling
360**

and ColdSense make ingredients last longer and help reduce food waste.

124,000

people engaged on sustainable eating since 2016.

70%

recycled plastic in the inner liners of our new built-in refrigerators.

Millions reached

through global campaign on more sustainable laundry habits.

35%

of ocean cargo transported with more sustainable fuels.

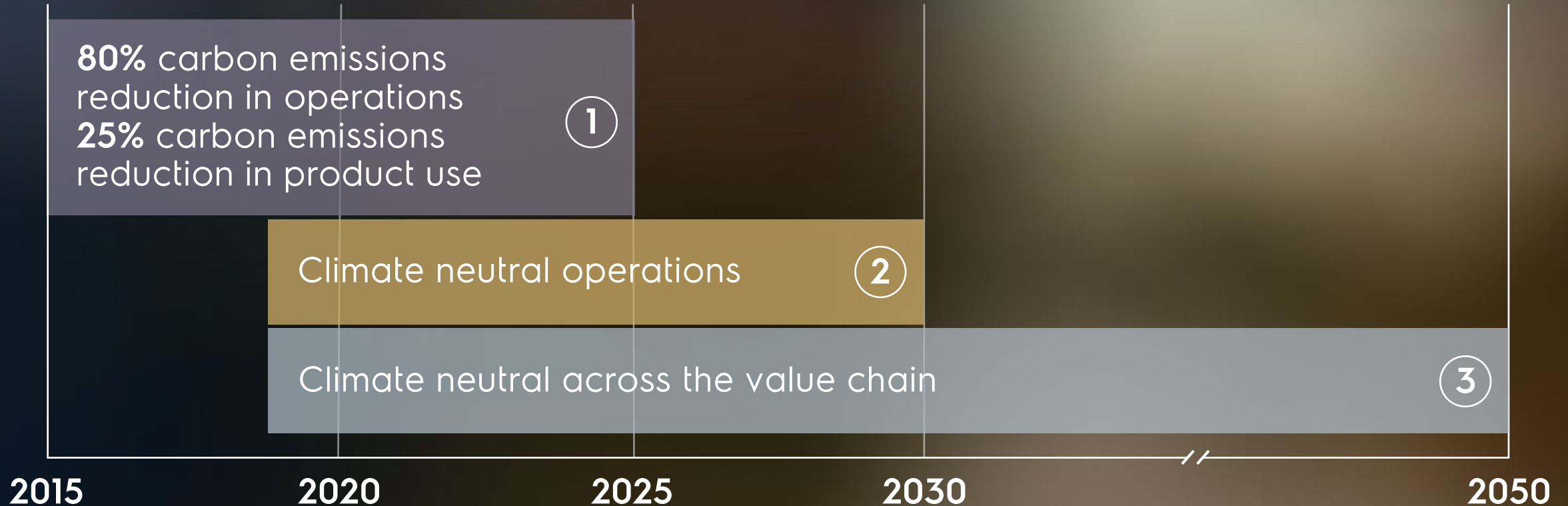
4,000

components tested for chemical compliance.

First vac without paint

to reduce chemical use, energy and material impact.

Electrolux Group roadmap to climate neutrality



1. Science Based Target (SBT) Scope 1 + Scope 2 - 80% reduction and Scope 3 - 25% reduction by 2025
2. Company target, Climate neutral operations (Scope 1 + Scope 2 = 0) by 2030
3. UNGC Business ambition for 1.5°C - climate neutral value chain by 2050

Climate Goals – our emissions reductions 2022



Scope 1 and 2* ***

-82%

greenhouse emissions
reduction in 2022
compared to 2015..

Scope 3*

>25%

greenhouse emissions
reduction from the use of
products compared to
2015.

* Science based target (SBT)

** Includes contributions from energy use
and greenhouse gas fugitive emissions.

Green Spirit Program - *How it started?*



- In 2007, Electrolux CEO, **Hans Stråberg**, announced the first global energy target
- The target was to reduce 15% by 2010, compared to 2005
- All plants got an annual target of 3% per year
- Green Spirit leaders appointed in all the plants
- Green Spirit strategy developed



Green Spirit - *Achieve more with less*



We are reducing our own footprint by running efficient operations all around the world.

Our promise

Electrolux will continue to reduce its environmental footprint by shifting to renewables, and optimizing the use of energy and other resources throughout its operations.

The roadmap to 2020

- Improve energy efficiency at manufacturing sites and warehouses by 20% by 2020 (baseline 2015), engaging all facilities worldwide.
- Reduce water consumption in manufacturing by 5% every year in areas of water stress, until the site has reached optimal levels of efficiency.
- Attain ISO 50001 energy management certification for our operations around the world.
- Increase the share of renewable energy for our operations to 50% by 2020.
- Implement a Zero Landfill program at all manufacturing sites by 2020.



Green Spirit - Strategy



Energy Management system

- Follow up on energy use on a monthly basis
- Energy saving action plan to reach yearly targets

Integration of Green Spirit within the Lean program

- KPI tracking towards target – monthly management review
- Green Spirit annual site certification & Awards

Employee engagement

- Sharing best practices – bench marking/innovation
- For The Better information boards
- Suggest & win campaign

Investing in energy-lean technologies

- Request suppliers to follow our Equipment Energy Efficiency Guideline and provide energy declarations





Green Spirit program

- ✓ Plant Manager has to nominate a Green Spirit Leader and set-up Green Spirit Team.
- ✓ Monthly KPI reporting has to be in place
- ✓ Plant has to have a Green Spirit action plan with energy and water efficiency improvement actions
- ✓ Set For the Better information board

Reporting :

$$\text{Green Spirit Energy KPI} = \frac{\text{Total energy consumption}}{\text{Total Standard unit production volume}} \quad [\text{kWh/std unit}]$$

In the Energy Consumption data should be included all energies related to the production (factory), offices directly linked to the production, and factory finished goods warehouse.

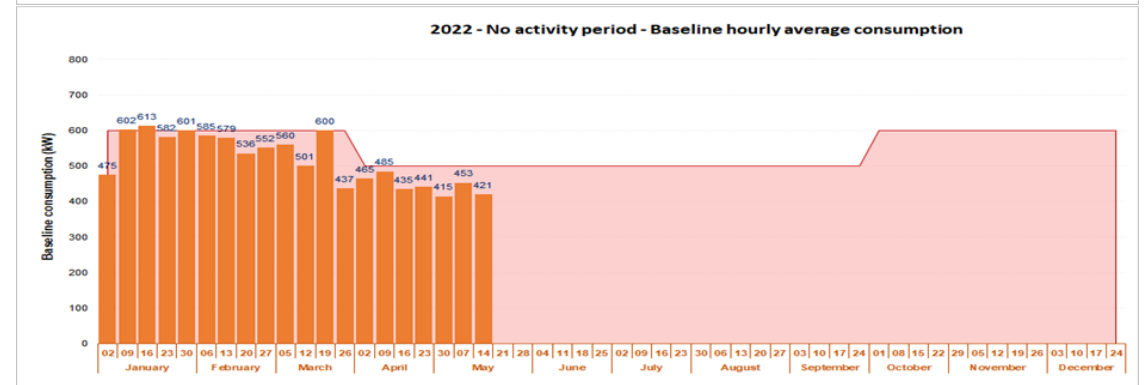
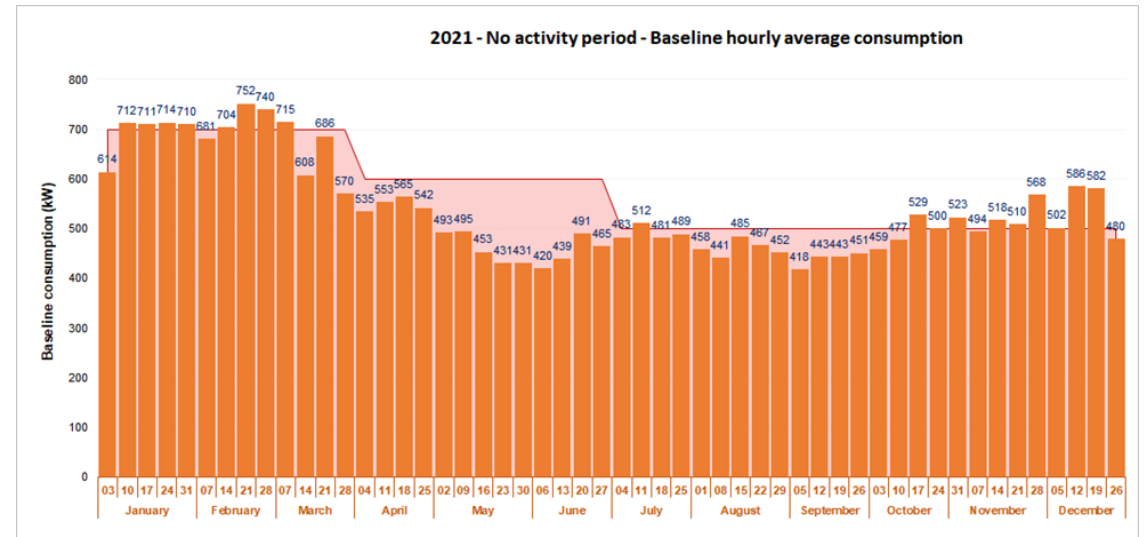
$$\text{Green Spirit Water KPI} = \frac{\text{Total water consumption}}{\text{Total Standard unit production volume}} \quad [\text{m3/std unit}]$$

In the Water Consumption data should be included all water related to the production (factory), offices directly linked to the production, and factory finished goods warehouse.

Green Spirit in practice



- The „Site certification“ assessment has a structured requirement list
- We need show and provide evidences in each chapter
 - Bronze requirements – Basic, foundation ...
 - Organisation & team, people involvement
 - Summer/ Winter temperature control
 - Downtime energy management
 - Compressed Air leak repair
 - Compressed air pressure reduction
 - Energy efficiency in case of new purchased equipment
 - Water management and reduction planning
 - Energy management and reduction planning



Green Spirit in practice

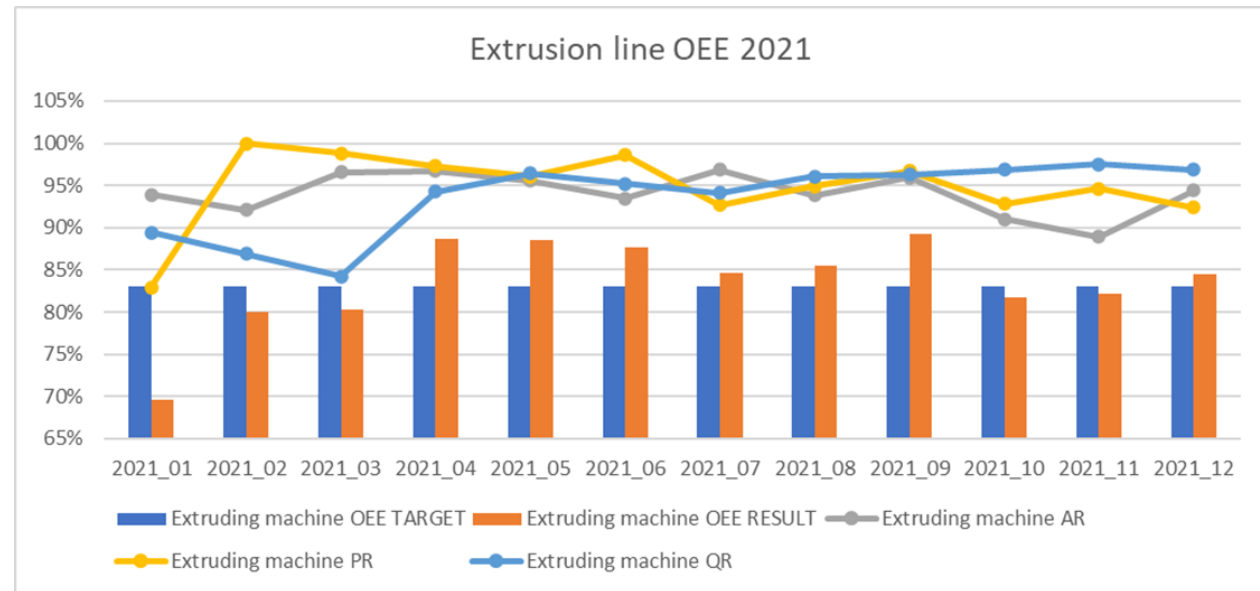


- Silver requirements :

- Efficiency of high energy consuming processes :

„ The factory has performed an assessment of the energy intensive processes existing in the factory. These processes are known, and its energy sources have been identified. Processes are ranked in a chart that allows to identify the top energy consumers.”

megnevezés	kWh	Teljes telephelyi %
Koextruder-Hatásos Energia	939195	7,70%
Festő-Hatásos Energia	688416	5,64%
Technológia TE9-Hatásos Energia	444038	3,64%
COMI-Hatásos Energia	416744	3,41%
110.ép. Világítás-Hatásos Energia	353105	2,89%
Perros III.-Hatásos Energia	336295	2,76%
K.Kompresszor-Hatásos Energia	324872	2,66%
Tes thabosító TE4.2-Hatásos Energia	320781	2,63%
Ajtógyártó TE5.2-Hatásos Energia	295505	2,42%
Hőtechnika labor-Hatásos Energia fennmaradó	273106	2,24%
77.sz épület világítás-Hatásos Energia	272842	2,24%
1.2 Kompresszor 1 betáp-Hatásos Energia	260424	2,13%
105 Kompresszorház-Hatásos Energia	258111	2,12%
Kompresszorház (betáp1+2) fennmaradó	254903	2,09%
77.sz épület erőátvitel-Hatásos Energia fennmaradó	253577	2,08%
Daraboló új csarnok-Hatásos Energia	252583	2,07%
RB szellőzés I.-Hatásos Energia	246328	2,02%
1.2 Kompresszor 2 betáp-Hatásos Energia	214584	1,76%
Csomagoló TE8-Hatásos Energia	202056	1,66%
03. csarnok-Hatásos Energia fennmaradó	189547	1,55%
Daraboló-Hatásos Energia	187886	1,54%



Green Spirit in practice

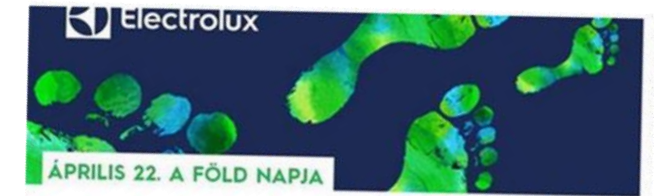


- Gold requirements:

- Green Spirit KPI Attainment
- Compressed air usage monitoring
- Lighting system analysis
- People awerness and Communication
- Renewable energy and Energy efficiency

- Platinum requirements:

- Study and document required physical plant changes to implement one piece flow from fabrication to assembly
- Value Stream Map



EGY NAP, AMI ARROL SZOL, MI MIT TEHETÜNK A FÖLDÜNKERT

Kedves kollégák!

Az Electroluxnál kiemelten fontos a fenntartható és környezetudatos működés, hogy bolygónk korlátozott erőforrásaival okosan bánjunk. Példát akarunk mutatni ezen a területen, hogy az ipart, beszállítóinkat és a vásárlóinkat is arra ösztönözzünk, tegyenek környezet védelméért.



A Föld napján éppen ezért mindenkit arra bátorítunk, hogy tájékozódjon és tegyen a bolygó megővéséért. De mindez hogyan is lehetséges?

I: Játssz és Nyerj a Föld Napja kvízzjátékunkon!

Csatlakozz te is az Electrolux Föld Napja fenntarthatósági játékához, amit ezen a [FÖLD NAPJA KVÍZ](#) [sharepoint.com](#) érsz el. Tudod mi a klímasegesség? Gondolkoztál már azon, hogy egyszerű lépésekkel mennyit lehetsz a káros környezeti hatás csökkentéséért? Válaszolj pár egyszerű kérdésre, építsd be a számodra tanulságos tanácsokat a hétköznapiakba, a helyes megfejtők

Case study 1 – The coffee machine – „Small things count..”



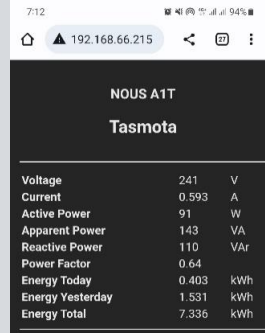
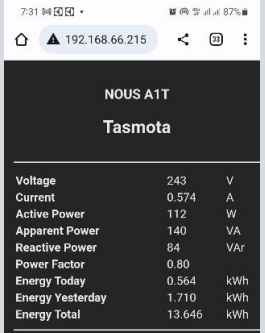


- Idea was come from „switch off” management approach – „ switch off if not in use”
- We are using water dispensers and coffee machines all over the sites (factory hall, offices, etc.)
- They were running 24/7 around a year
- The real demand only in workdays and office hours:
 - 0 hours on weekends and bank holidays
 - 10 hours on working days
- Using a „smart plug” we were measured the consumption and we are able to control the operation time.
- The cost of the plug ~ 7000 HUF



NOUS A1T Tasmota		
Voltage	241	V
Current	0.593	A
Active Power	91	W
Apparent Power	143	VA
Reactive Power	110	VA _r
Power Factor	0.64	
Energy Today	0.403	kWh
Energy Yesterday	1.531	kWh
Energy Total	7.336	kWh



Case study 1 – „Small things count ...”

	Water	Coffee machine
<p>weekends/bank holiday : $365-252=113$ days</p> <p><u>Saving</u> :</p> <p>Water: $113\text{days} * 1,5\text{kWh} = 170\text{kWh/year}$</p> <p>Coffee machine : $113\text{days} * 1,7\text{kWh} = 192 \text{ kWh/year}$</p>	 <p>1,5 kWh/day</p>	 <p>1,7 kWh/day</p>
<p>Working days : 252 days</p> <p><u>Saving</u> : (considering an even distribution of the consumption during 24hours run)</p> <p>Water : $1,5\text{kWh}/24\text{h} * 14\text{h} * 252\text{days} = 220 \text{ kWh/year}$</p> <p>Coffee machine : $1,7\text{kWh}/24\text{h} * 14\text{h} * 252\text{days} = 250 \text{ kWh/year}$</p>	 <p>1,7 kWh/day</p>	 <p>2,1 kWh/day</p>

Yearly saving per machine :

390 kWh/year

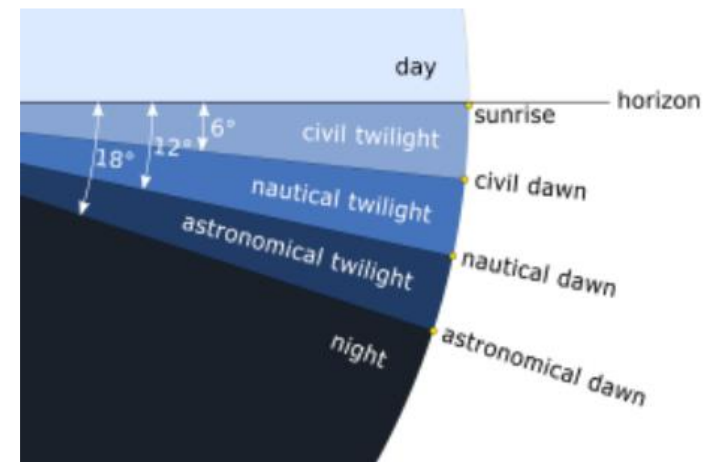
442 kWh/year



Case study 2 – External lighting switch off

- Idea was come from „switch off“ management approach – „ switch off if not in use“
- There are several lighting unit providing the safe condition when it’s dark
- Theory / New rules :
 - Instead of sunrise we use the time of dawn: 35mins
 - Instead of sunset we use the time of dusk: 4mins
- Today, the operation time of the lighting is shorter than before due to the adjustment.
- In practice : the sensivity of the twilight switches were adjusted according to the real lighting condition -> ~ 30 mins less on time
- Cost : 0
- Saving (estimated) : $365 \times 0,5h \times 5kW = 912,5 \text{ kWh}$

SUNLIGHT MAY 10, 2023	STARTS	ENDS
Morning astronomical twilight	03:04 am	03:58 am
Morning nautical twilight	03:58 am	04:43 am
Morning civil twilight	04:43 am	05:18 am
Sunrise	05:18 am	05:22 am
Morning Golden Hour	05:22 am	06:02 am
Solar Noon	12:44 pm	
Evening Golden Hour	07:25 pm	08:05 pm
Sunset	08:05 pm	08:09 pm
Evening civil twilight	08:09 pm	08:44 pm
Evening nautical twilight	08:44 pm	09:29 pm
Evening astronomical twilight	09:29 pm	10:23 pm
Night	10:23 pm	-



Case study 3 – Plastic extrusion efficiency

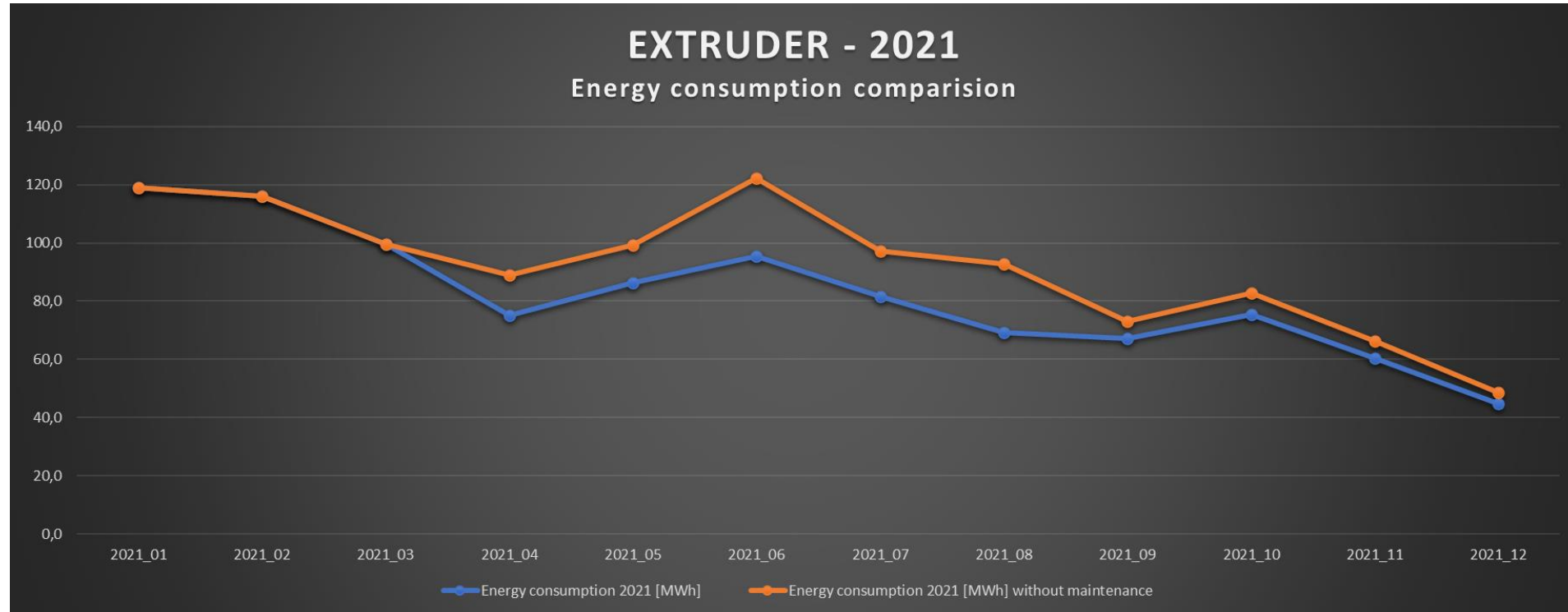


- To improve the output of the co-extrusion line we were evaluate and execute a complete cleaning of the line in March-April of 2021
- The efficiency improvement coming from :
 - Less black spot at the HIPS
 - Less rejected material
 - Less grinding (electrical consumption included)

Savings calculation					
1-3 months AVG		4-12 months AVG			
334,7		655,1			
959 079		2 210 457		Extruding machine material usage -4-12 months	2 210 457 kg
0,35		0,30		Energy consumption savings [kwh/kg]	0,05 [kwh/kg]
				SAVINGS	116 MWh
					1,4 months

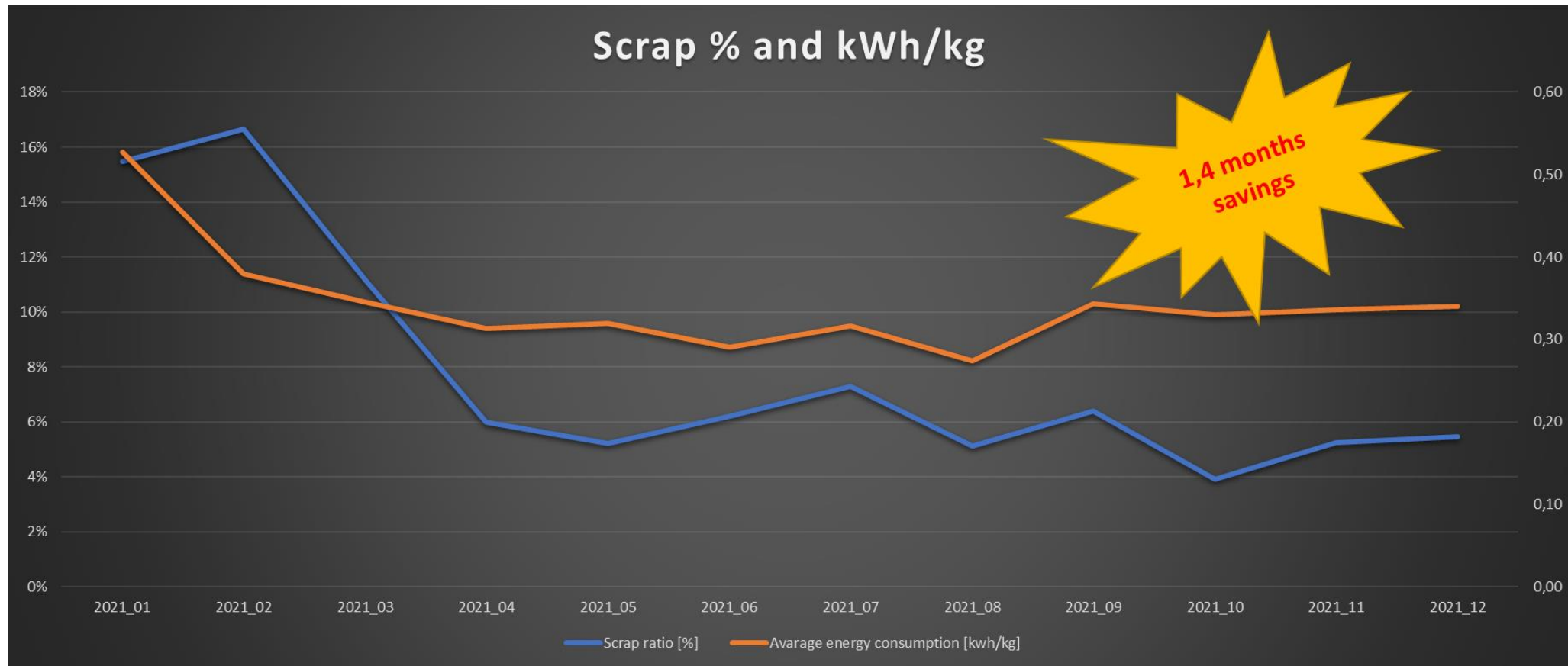
Extruder	2021_01	2021_02	2021_03	2021_04	2021_05	2021_06	2021_07	2021_08	2021_09	2021_10	2021_11	2021_12
Energy consumption 2021 [MWh]	119,1	116,1	99,5	75,0	86,2	95,4	81,6	69,1	67,2	75,4	60,4	44,7
Extruding machine material usage [kg]	267 301	367 163	324 615	254 580	284 859	350 289	278 756	265 965	209 338	237 531	190 075	139 064
Extruding machine scrap [kg]	41 387	61 145	36 206	15 261	14 814	21 706	20 319	13 580	13 378	9 320	9 971	7 606
Scrap ratio [%]	15%	17%	11%	6%	5%	6%	7%	5%	6%	4%	5%	5%
Average energy consumption [kwh/kg]	0,53	0,38	0,34	0,31	0,32	0,29	0,32	0,27	0,34	0,33	0,34	0,34

Case study 3 – Plastic extrusion efficiency



Extruder	2021_01	2021_02	2021_03	2021_04	2021_05	2021_06	2021_07	2021_08	2021_09	2021_10	2021_11	2021_12
Energy consumption 2021 [MWh]	119,1	116,1	99,5	75,0	86,2	95,4	81,6	69,1	67,2	75,4	60,4	44,7
Energy consumption 2021 [MWh] without maintenance	119,1	116,1	99,5	88,8	99,4	122,2	97,3	92,8	73,1	82,9	66,3	48,5
saving	0,0	0,0	0,0	13,9	13,2	26,9	15,7	23,7	5,9	7,5	5,9	3,8
Extruding machine material usage [kg]	267 301	367 163	324 615	254 580	284 859	350 289	278 756	265 965	209 338	237 531	190 075	139 064
Extruding machine scrap [kg]	41 387	61 145	36 206	15 261	14 814	21 706	20 319	13 580	13 378	9 320	9 971	7 606

Case study 3 – Plastic extrusion efficiency





Panel discussion– *Downtime management*

- Are you aware of your downtime consumption?
 - Electricity, compressed air, etc.
- Who is responsible of the downtime consumption?
- Do you know how much is your downtime consumption?
 - It can be significant, just an example our starting point was :
1 day downtime ~ 1 day consumption of the plastic extrusion line
- Do you measure it? Do you know how to measure ?
 - We consider a consumption of Sunday's as downtime consumption.
- Do you know the content? Which are the main users?
- Do you checking the necessity of the consumption?
- Do you have action plan how to reduce?



Thank you for the attention!

Q & A



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