

Designing a sustainable Linac

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Elekta Limited

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Agenda

1. Who we are
2. Environmentally Conscious Design
3. How we apply it in Elekta
4. Circular Economy – a highlight

Who we are

Elekta

Hope for everyone dealing with Cancer



LEKSELL GAMMA KNIFE® ICON™

The intracranial
radiosurgery choice

The moment Elekta
took its first step into
precision radiation
medicine



ELEKTA UNITY

Two worlds,
one future

The moment the tumor
has nowhere to hide



FAMILY OF LINACS

HD feature additions

The moment
high-precision care
becomes available for
everyone



BRACHYTHERAPY

Indispensable
radiation therapy

The moment combining
new treatments reaches
new potential



DIGITAL SOLUTIONS

Information-guided
care™

The moment intelligent
software delivered
personalized care

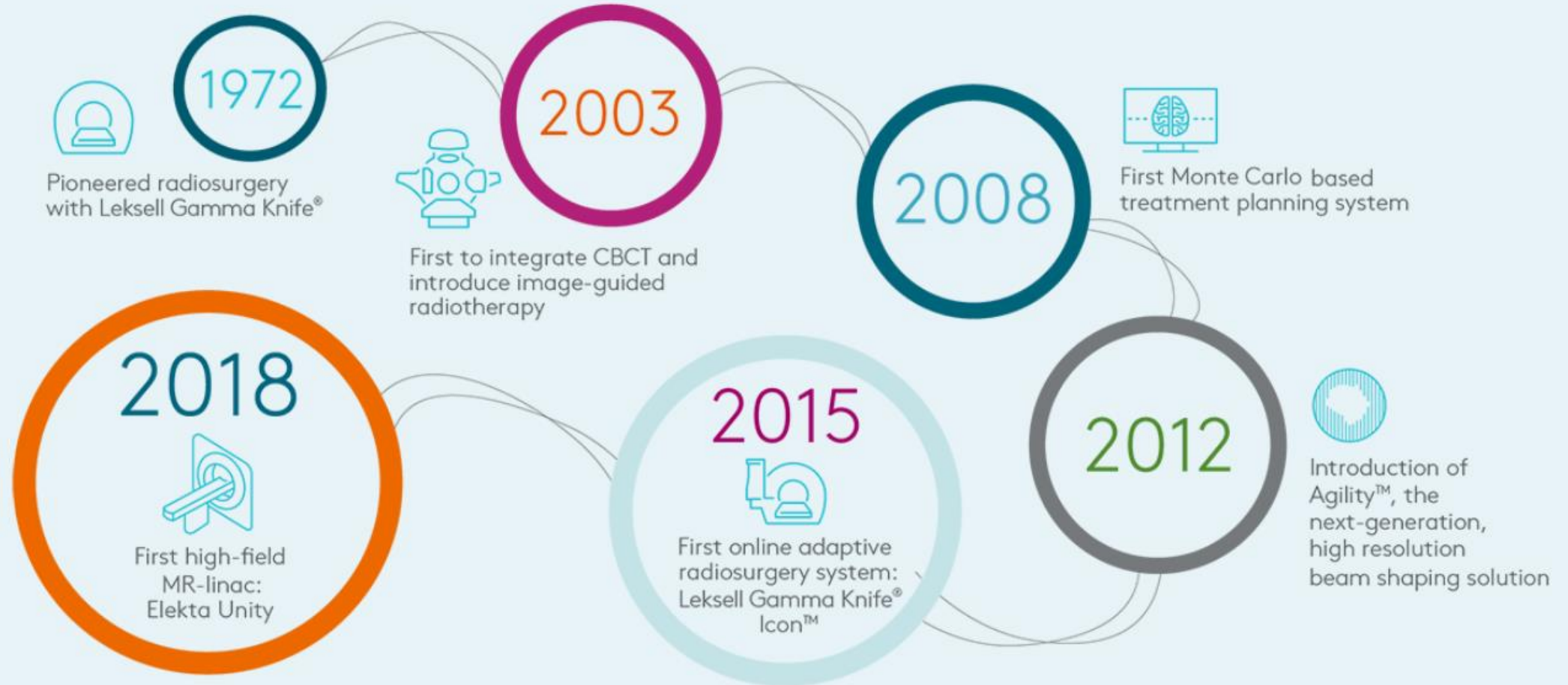


ELEKTA CARE™ SERVICE

You focus on the
patient,
we focus on you

The moment service
becomes a partnership

Pioneer in Precision Radiation Medicine



Environmentally Conscious Design

An introduction

ECD Targets and Requirements



- Reduce the depletion of natural resources
- Identify redundant or over-specified parts
- Minimise weight of new designs
- Review and reduce the cost required to set-up the Linac Product
- Improve ease of disassembly
- Optimise the amount of lead/tungsten used for shielding
- Design all new products to facilitate remote fault diagnostics.

Relevant Standards

ISO14001:1996

International standard for an effective Environmental Management System.

IEC 60601-1-9*

Requirements for Environmentally Conscious Design

NEMA Standards Publication NEMA/MITA 1

Good Refurbishment Practices for Medical Imaging Equipment

Elekta's Environmentally Conscious Design Policy



How we apply it in Elekta

Set company goals

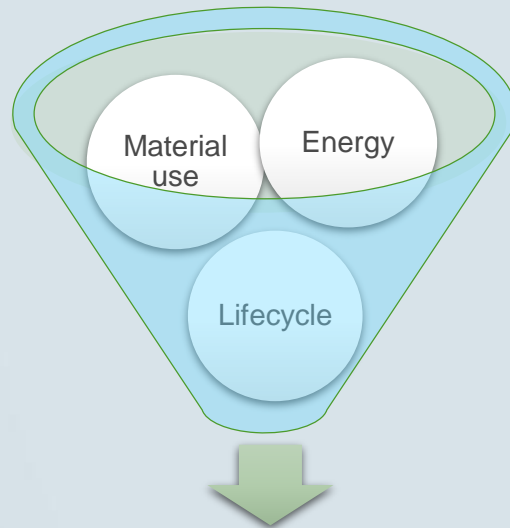
Examples of Elekta's ECD goals:

- Circular Economy
 - └ **Take back selected parts of relevant products by the end of 2022 & establish a refurbishment program to use reclaimed parts & components by 2025/26.**
- Waste management
 - └ **Reduce selected packaging 30% by 2025/26 & objective of achieving zero waste to landfill by 2026**
- Climate change
 - └ **Reduce direct & indirect GHG emissions intensity (Co₂e/kwH or net sales)**



Build a baseline

Estimate impact of current products



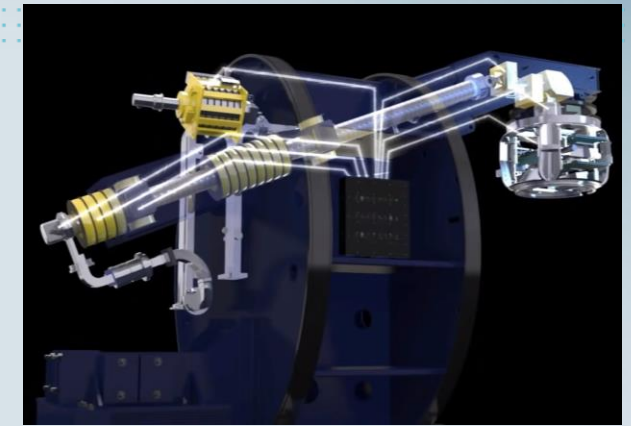
1. Product specific meaningful targets
2. Project opportunities
3. Savings quantification

CO2 eq conversion factors

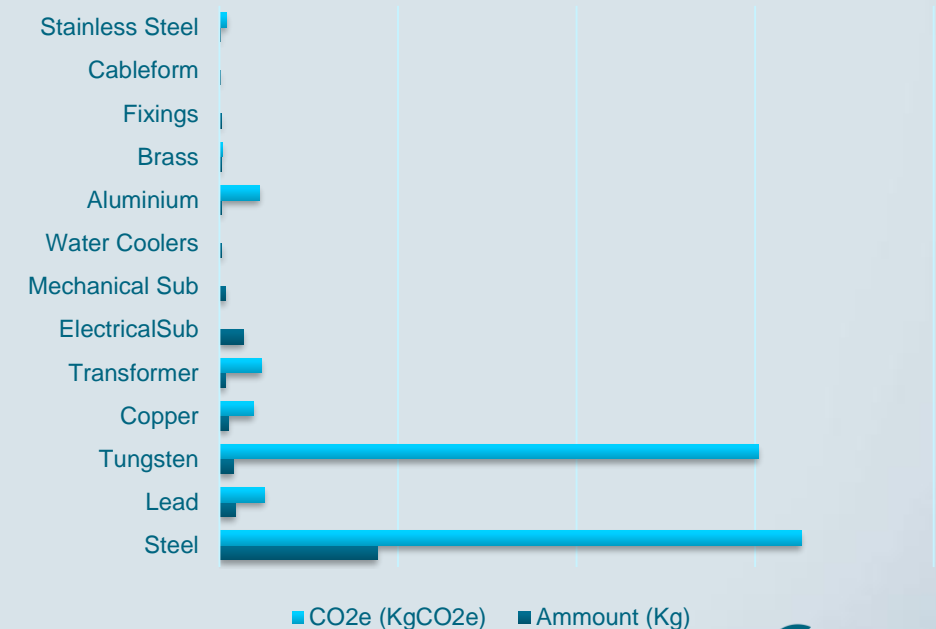
CO2 footprint (kgCO2/kg material)										
Source	Aluminium	Stainless Steel	Lead	Steel	Tungsten	Wood	Bronze	Copper	Brass	Transformer
Primary production	13.90	7.11	2.38	2.38	66.15	1.42	7.10	6.74	5.54	6.57
Casting	0.69		0.41		0.69					
Rough rolling, forging	0.11	0.18	0.10	0.23	0.20		0.39	0.16	0.19	
Coarse machining (per unit wt removed)	0.05	0.06	0.04	0.07	0.06	0.07	0.09	0.06	0.05	
Fine machining (per unit wt removed)	0.17	0.27	0.08	0.35	0.30		0.59	0.25	0.15	
Grinding (per unit wt removed)	0.29	0.51	0.12	0.66	0.57		15.25	0.45	0.53	
Recycling	2.67	1.30	1.35	0.67	7.84		1.21	1.06	1.97	
SUM TOTAL	17.88	9.43	4.48	4.36	75.81	1.49	24.63	8.72	8.43	6.57

Material saving – Elekta Limited

- (MR Linac) Use of advanced modelling techniques to optimise design and minimise material use.
- Beam attenuator material and design change; 6846 Co2e (kg) reduction (per machine!)
- Console desk design update, reduction from 8 monitors to 3 was achieved
- Scrapping manual papers: reduction of around 1600 kgs of paper per year

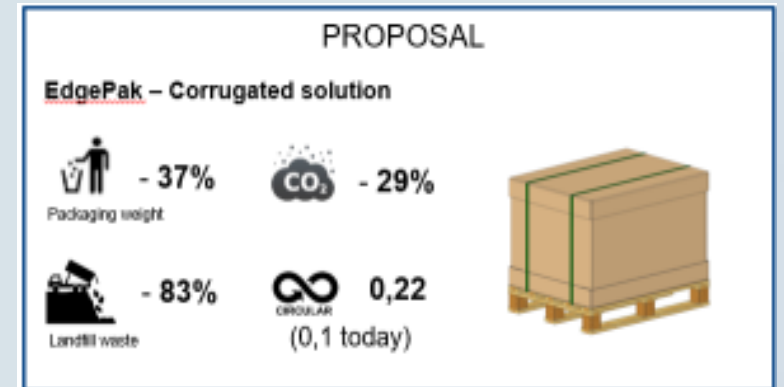


Material amount vs CO₂equivalent emissions



Packaging and installation improvements

- Analysis of most efficient freight mode
 - E.g. Changing air freight to sea freight resulted in a smaller carbon footprint, even though the distance was larger.
- Improvement of packaging material & design
 - E.g. Efficient dimensions, limit screw number & include forklift access in design where applicable
- Last mile optimisation (LMO)



Circular economy

Service loop

(planned and corrective maintenance)

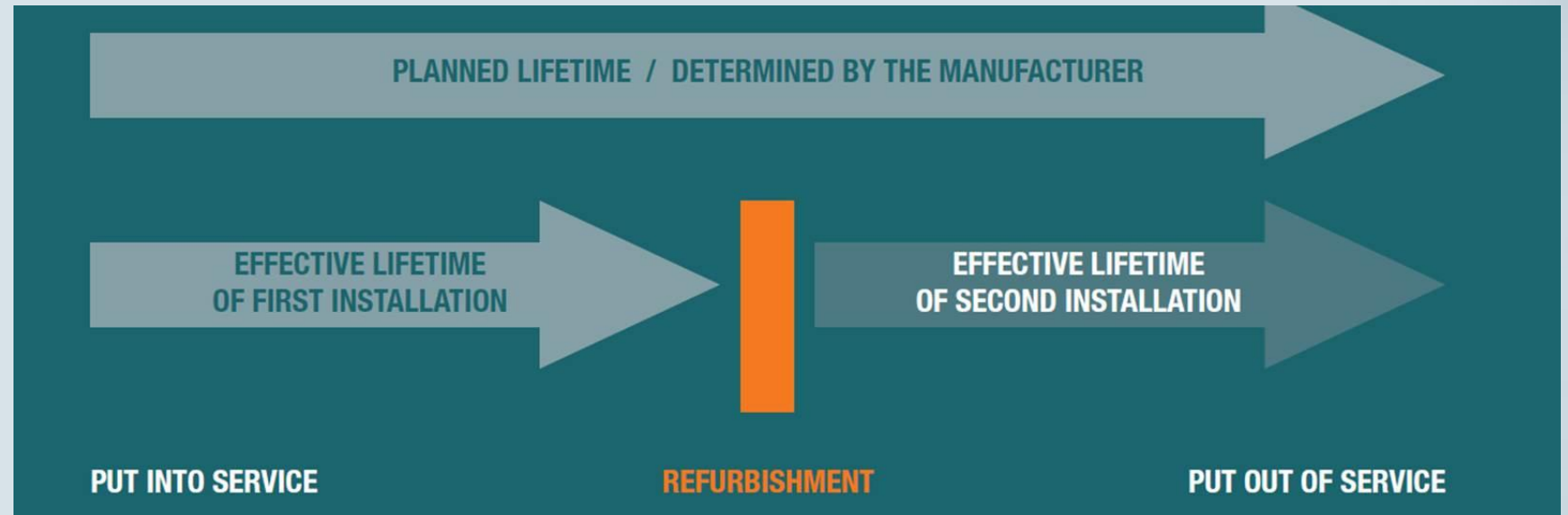
Development considerations:

- Fault finding mechanisms
- Remote support availability.
- Design with reliability considerations



Product circularity

- Parts Harvesting
- Recycling



Thank you