



Nachhaltige Produktentwicklung und ihr Beitrag zur Kreislaufwirtschaft

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Externe Treiber der nachhaltigen Produktentwicklung



EU Taxonomie



Circular Economy Action Plan



CSRD



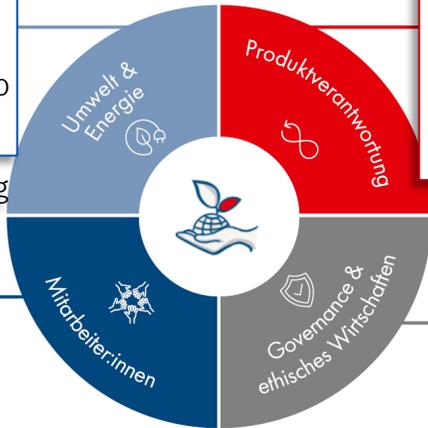
Kundenanforderungen

Übergang vom Handlungsfeld zur nachhaltigen Produktentwicklung



Umwelt & Energie

- Verantwortungsvoller Materialeinsatz
- Abfall & Recycling



Produktverantwortung

- Produktentwicklung
- Nachhaltiger Produktlebenszyklus

Mitarbeiter:innen

- Arbeitssicherheit & Gesundheit
- Diversität & Chancengleichheit
- Faire Entlohnung & betriebliche Leistungen

Governance & ethisches Wirtschaften

- Nachhaltige Lieferketten
- Integrität & Compliance



Steuergrößen einer nachhaltigen Produktentwicklung



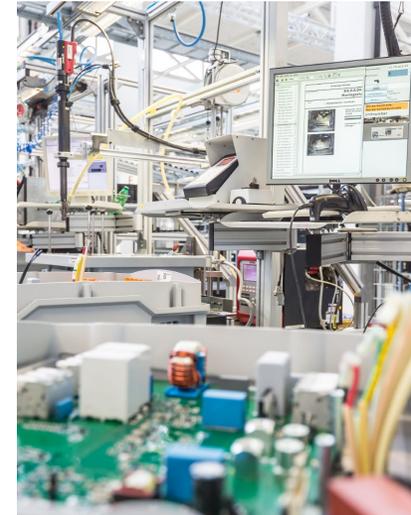
In der Entwicklung (wenn möglich) auf gefährliche Stoffe zu verzichten



Bauteile mit einem möglichst hohen Sekundärrohstoffanteil verwenden



Den CO₂ Fußabdruck von Bauteilen bei der Entwicklung betrachten



Vermeint alte Wechselrichter reparieren (*Global Repair Program*)



Beim Design den Fokus auf eine hohe Lebensdauer legen

Was sind gefährliche Stoffe?



- ❖ Gefährliche Substanzen sind in Material Compliance Anforderungen reguliert
- ❖ Welche Anforderungen betreffen mich?
- ❖ Material Compliance Management System implementieren
- ❖ Prüfen welche Bauteile mit gefährlichen Substanzen substituiert werden können

EU Taxonomie & gefährliche Stoffe



DNSH – Appendix C

Appendix C: Application level(s) (1/2)

Exemplary status of compliance that could occur in case of a HARD interpretation of APP. C

OPTION 1 – “HARD” interpretation of Appendix C

Fulfillment of requirements

Current **exemptions** to the prohibitions to use certain substances **are NOT allowed** in the context of Appendix C, except where explicitly mentioned in Appendix C

G = Governance I = Implementation M = Monitoring

The activity does not lead to the manufacture, placing on the market or use of:		EU countries	NON-EU countries
a)	POP (Persistent Organic Pollutants) Substances in Annexes I and II to Regulation (EU) 2019/1021 , except in the case of substances present as an unintentional trace contaminant	G: full prohibition of substances required in policies (no exemptions allowed – except the one explicitly mentioned on the left) ? - I: implementation process / doc to be clarified / set up ? - M: Monitoring gap, new control processes needed -	G: full prohibition of substances required in policies (no exemptions allowed – except the one explicitly mentioned on the left) ? - I: implementation process / documentation might need to be clarified / set up ? - M: Monitoring gap, new control processes needed -
b)	Mercury Mercury and mercury compounds, their mixtures and mercury-added products as defined in Article 2 of Regulation (EU) 2017/852	G: full prohibition of substances required in policies (no exemptions allowed – except the one explicitly mentioned on the left) ? - I: implementation process / documentation might need to be clarified / set up ? - M: Monitoring gap, new control processes needed -	G: full prohibition of substances required in policies (no exemptions allowed – except the one explicitly mentioned on the left) ? - I: implementation process / documentation might need to be clarified / set up ? - M: Monitoring gap, new control processes needed -
c)	ODS (Ozone Depleting Substances) Substances, whether on their own, in mixture or in articles, listed in Annexes I or II to Regulation (EC) No 1005/2009	G: full prohibition of substances required in policies (no exemptions allowed – except the one explicitly mentioned on the left) ? - I: implementation process / documentation might need to be clarified / set up ? - M: Monitoring gap, new control processes needed -	G: full prohibition of substances required in policies (no exemptions allowed – except the one explicitly mentioned on the left) ? - I: implementation process / documentation needs to be set up ? - M: Monitoring gap, new control processes needed -
d)	RoHS (Electrical and electronic equipment) Substances, whether on their own, in mixtures or in an articles, listed in Annex II to Directive 2011/65/EU , except where there is full compliance with Article 4(1) of that Directive	G: full prohibition of substances required in policies (no exemptions allowed – except the one explicitly mentioned on the left) ? - I: existing tools / processes need to be adapted in order to reflect full prohibition ? - M: Monitoring gap, new control processes needed -	G: full prohibition of substances required in policies (no exemptions allowed – except the one explicitly mentioned on the left) ? - I: existing tools / processes need to be adapted in order to reflect full prohibition ? - M: Monitoring gap, new control processes needed -
e)	Substances, whether on their own, in mixtures or in an article, listed in Annex XVII to Regulation (EC) 1907/2006 , except where there is full compliance with the conditions specified in that Annex	G: full prohibition of substances required in policies (no exemptions allowed – except the ones explicitly mentioned on the left) ? - I: existing tools / processes need to be adapted in order to reflect full prohibition ? - M: Monitoring gap, new control processes needed -	G: full prohibition of substances required in policies (no exemptions allowed – except the ones explicitly mentioned on the left) ? - I: existing tools / processes need to be adapted in order to reflect full prohibition ? - M: Monitoring gap, new control processes needed -
f)	REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) Substances, whether on their own, in mixtures or in an article, meeting the criteria laid down in Article 57 of Regulation (EC) 1907/2006 and identified in accordance with Article 59(1) of that Regulation, except where their use has been proven to be essential for the society	G: full prohibition of substances required in policies (no exemptions allowed – except the ones explicitly mentioned on the left) ? - I: existing tools / processes need to be adapted in order to reflect full prohibition ? - M: Monitoring gap, new control processes needed -	G: full prohibition of substances required in policies (no exemptions allowed – except the ones explicitly mentioned on the left) ? - I: existing tools / processes need to be adapted in order to reflect full prohibition ? - M: Monitoring gap, new control processes needed -
g)	Other substances, whether on their own, in mixtures or in an article, that meet the criteria laid down in Article 57 of Regulation (EC) 1907/2006 , except where their use has been proven to be essential for the society.	G: full prohibition of substances required in policies (no exemptions allowed – except the ones explicitly mentioned on the left) ? - I: existing tools / processes need to be adapted in order to reflect full prohibition ? - M: Monitoring gap, new control processes needed -	G: full prohibition of substances required in policies (no exemptions allowed – except the ones explicitly mentioned on the left) ? - I: existing tools / processes need to be adapted in order to reflect full prohibition ? - M: Monitoring gap, new control processes needed -

Stockholmer-, Minamata-Übereinkommen und Montreal-Protokoll sind völkerrechtlich verbindliche Verträge – keine der Stoffe sollte im Produkt vorhandensein

RoHS: potentiell Substitution von Stoffen möglich

REACH: SVHC ... „except where their use has been proven to be essential for the society“



Substitution von SVHC`s



1. Ermittlung der Bauteile mit SVHC Stoffe



2. Anfrage bei Lieferanten, ob es Alternativen ohne SVHC Stoffe gibt



3. Technische Bewertung, ob die Alternativen eingesetzt werden können



4. Prozessanpassung: Im Entwicklungsprozess werden bei Neuanlage von Bauteilen SVHC Prüfungen durchgeführt



Einsatz von Sekundärrohstoffen



- ❖ Treiber ist ebenfalls die EU Taxonomie und die Kreislaufwirtschaft
- ❖ Welche Bauteile haben hier Relevanz?
- ❖ Bewusstsein bei Lieferanten
- ❖ Mono-Materialien vs komplexe



Ermittlung der Sekundärrohstoffquote



- 1.  Produzierte Wechselrichter/Jahr
- ↓
- 2.  Mapping der Stückliste mit den Verkaufszahlen
- ↓
- 3.  Beschränkung auf massenrelevante Bauteile > 80%
- ↓
- 4.  Anfrage durch Procurement bei

Betrachtung des CO₂ Fußabdruck im Entwicklungsprozess

- ❖ Ziel: Eine Steuergröße zur nachhaltigen Produktentwicklung schaffen
- ❖ Ein benutzerfreundliches Tool schaffen
- ❖ Basis eine ausführliche LCA eines Model Wechselrichters



Eco-Design Tool



Vorstudie: Ökodesign-Anforderungen in der Produktentwicklung SMA



Gültigkeit der Daten

Wissen über Hotspots

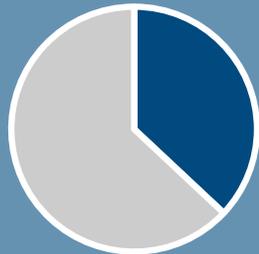
Life Cycle Assessment

- Basierend auf der Stückliste
- Hotspots für CO² Fußabdruck Herstellung
- Bewertung der Ergebnisqualität
- Andere Umweltauswirkungen als Kontrollgröße
- Dokumentation und Präsentation

Ergebnisse des Life Cycle Assessments



Aluminium



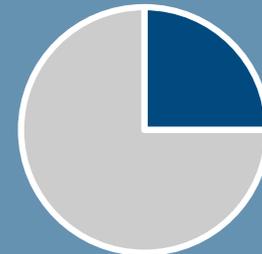
Masse 37%

vs.



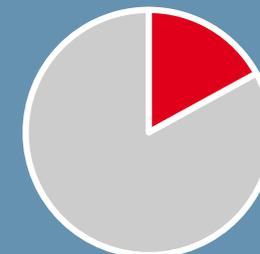
GWP* 34%

Drossel und Transformatoren



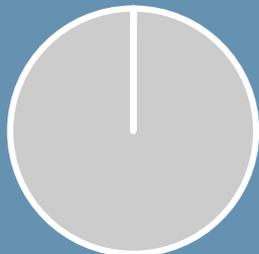
Masse 25%

vs.



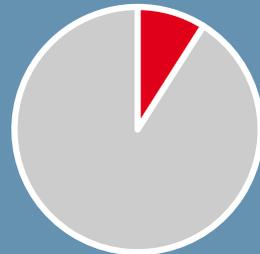
GWP* 17%

IC



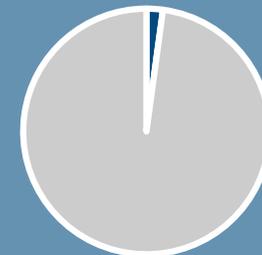
Masse 0,1%

vs.



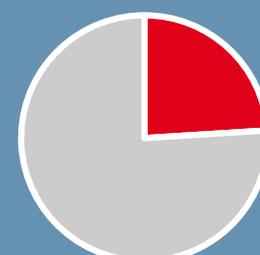
GWP* 9%

PCB



Masse 2,15%

vs.

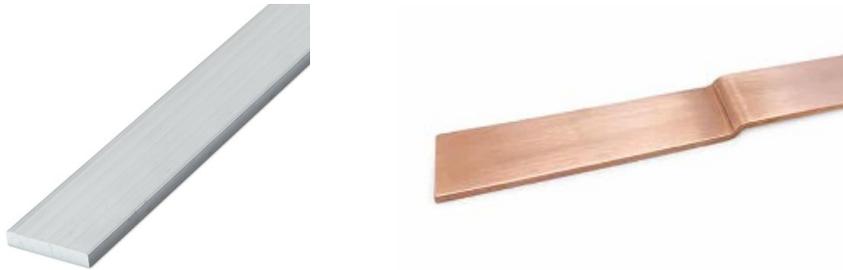


GWP* 24%

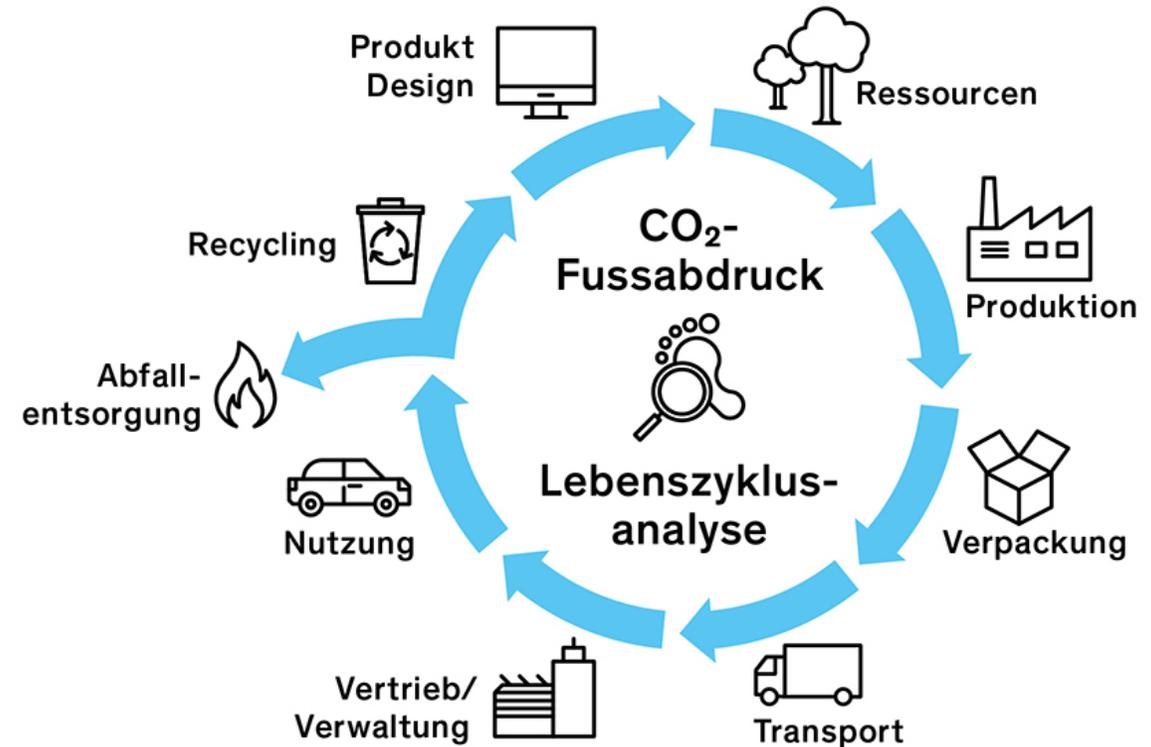
Entscheidungshilfe Eco-Design Tool



Aluminum vs. Kupfer



- ❖ Sekundärrohstoffanteil
- ❖ Elektrische Leitfähigkeit
- ❖ Masse
- ❖ ...





Danke