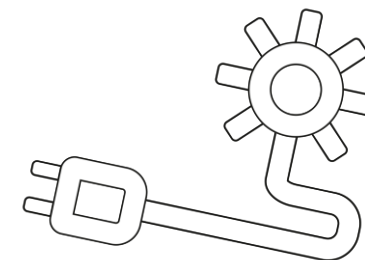
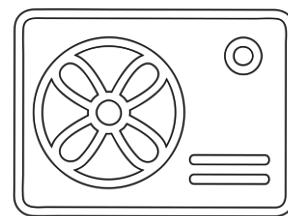
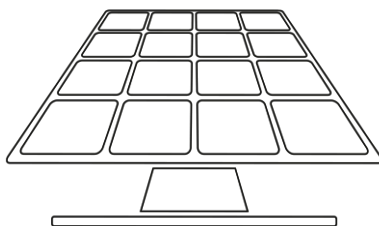
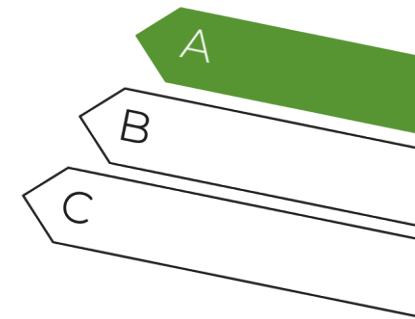
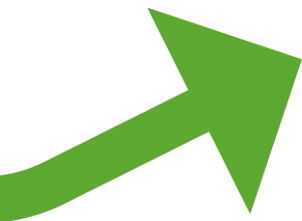
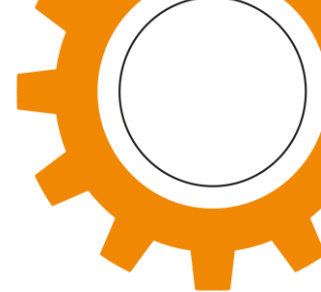
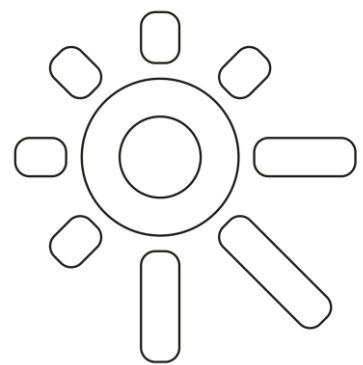


Samen maken we de Omslag

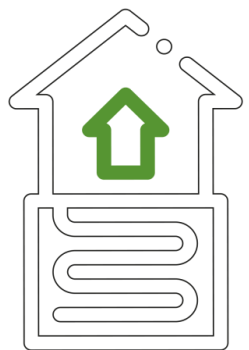
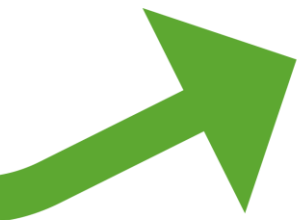
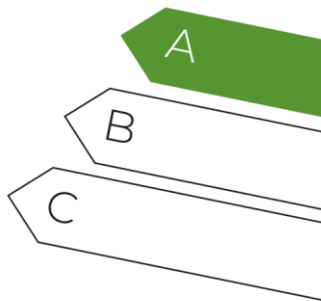
Energieke Avond Ransdaal

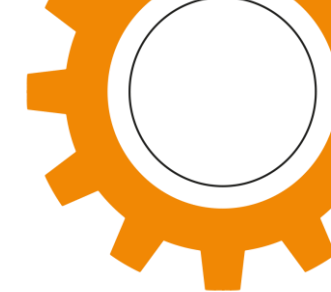
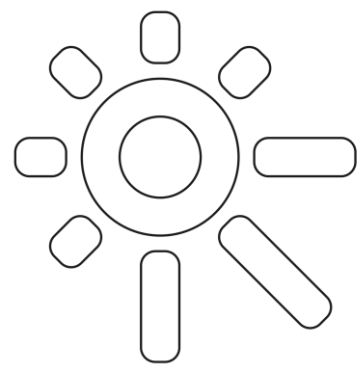
5 april 2023





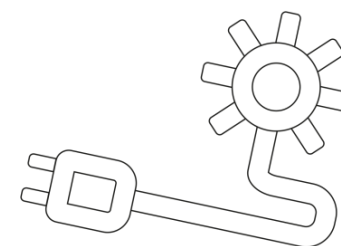
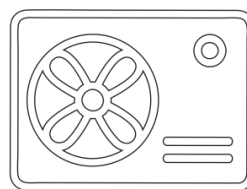
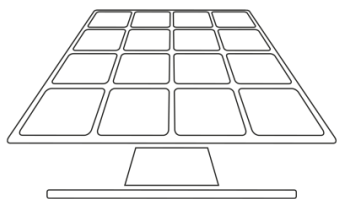
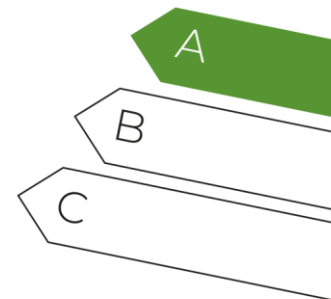
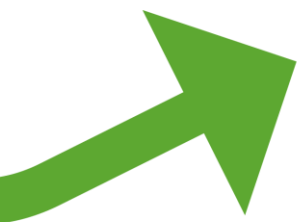
Wie zijn we?

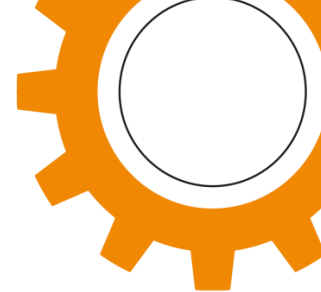
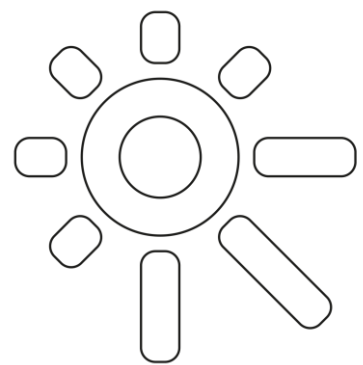




Hoe is het gekomen

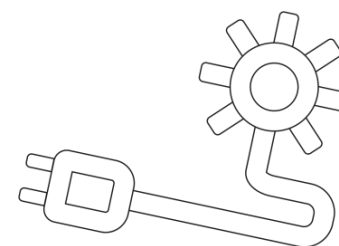
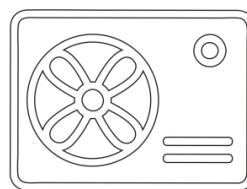
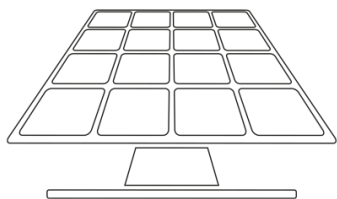
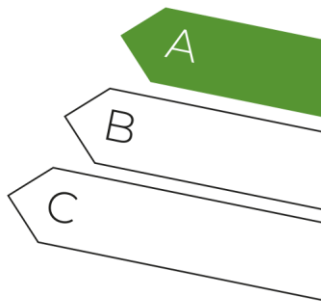
- Opgericht
 - 2019
- leden:
 - 65
- Lezers nieuwsbrief:
 - 300
- => we willen groeien! Doet U mee?





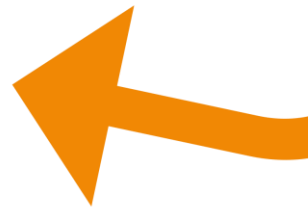
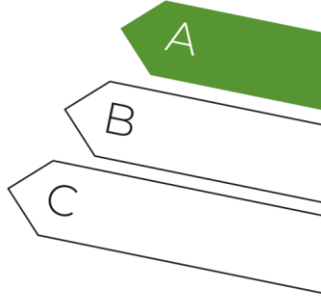
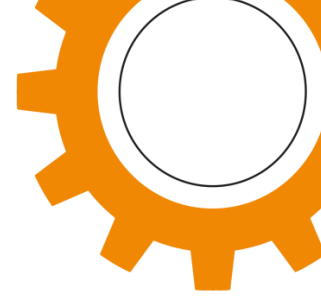
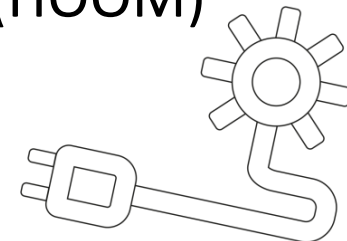
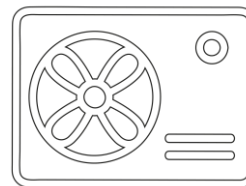
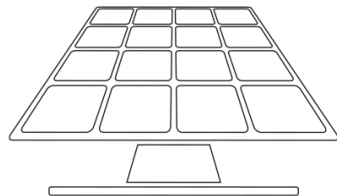
De Omslag staat niet alleen

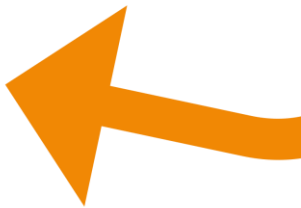
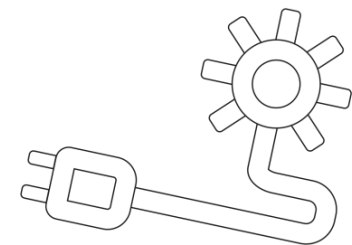
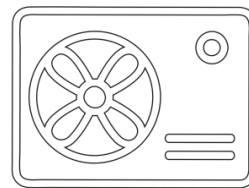
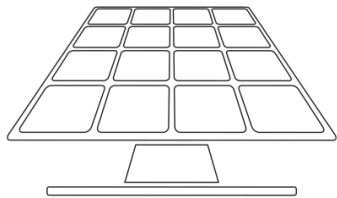
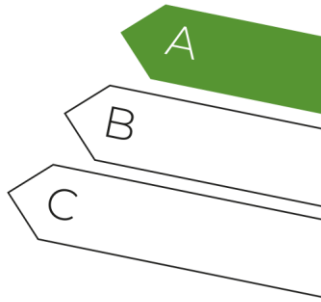
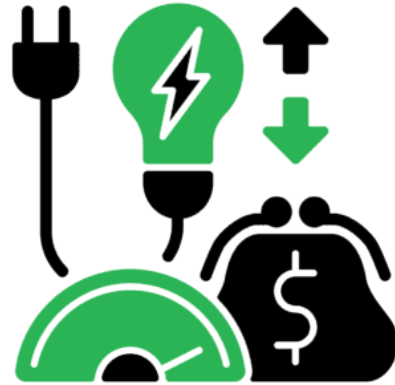
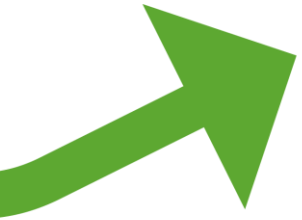
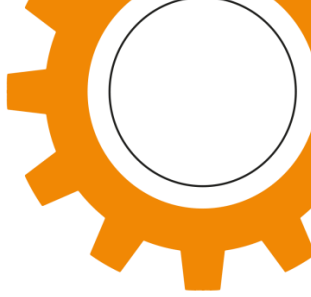
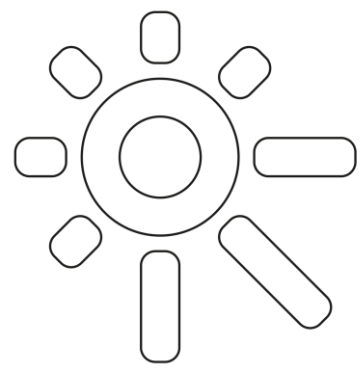
- **Andere Energiecoöperaties Limburg**
 - Werken samen, leren van elkaar
 - Ervaring uitwisselen
- **REScoop Limburg**
 - Kennisbank, Projectbureau
- **Landelijk: Energie Samen**
 - Politiek draagvlak
 - Landelijk beleid

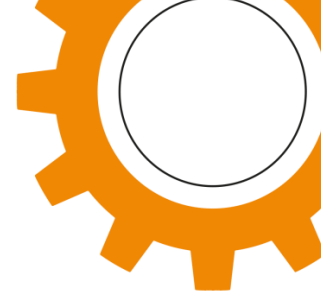
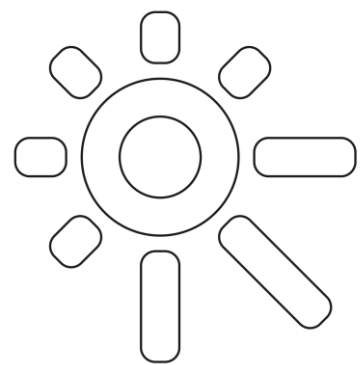


Wat kunt u van De Omslag verwachten?

- We willen samen energie opwekken
 - Zon op andermans dak (Postcoderoos)
 - 50% lokaal eigenaarschap invullen bij projecten ontwikkelaars
 - (100% op de Steenenis)
 - 75/90% lokaal eigenaarschap Windenergie Parkstad Zuid:
 - 7 turbines, 40.000 huishoudens
- We willen u helpen in de transitie
 - Energiebesparing – Isoleren – Energie Opwekken
 - Advies: samen met WWW of via De WattMeesters (HOOM)

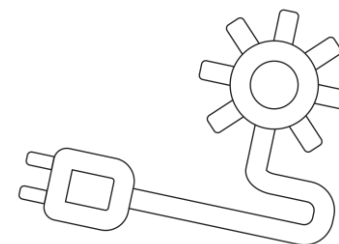
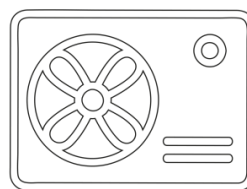
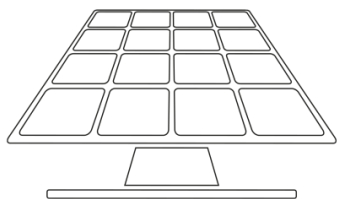
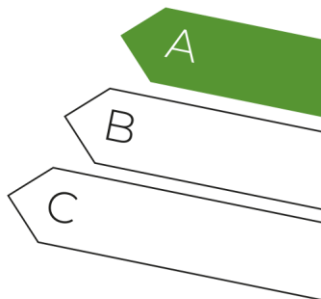
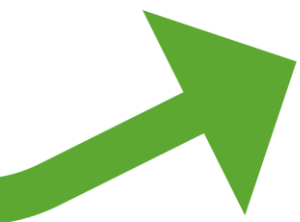


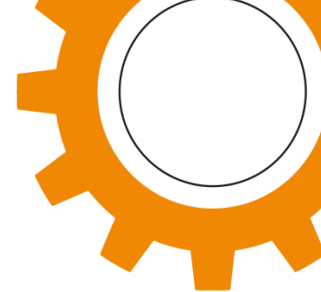
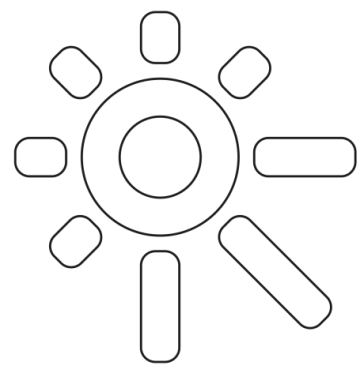




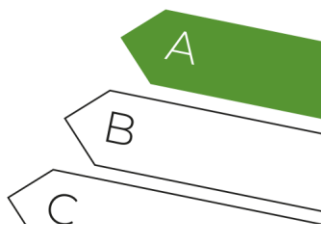
Het Energiecontract

- **Vast**
 - 6 maanden vast, vroeger tot 3 en 5 jaar!
- **Variabel**
 - Kan gewijzigd worden door energiemeatschappij
 - 30 dagen vtv
- **Flex**
 - Elk uur een andere prijs
 - Volgt de beurs





Flex: vraag en aanbod

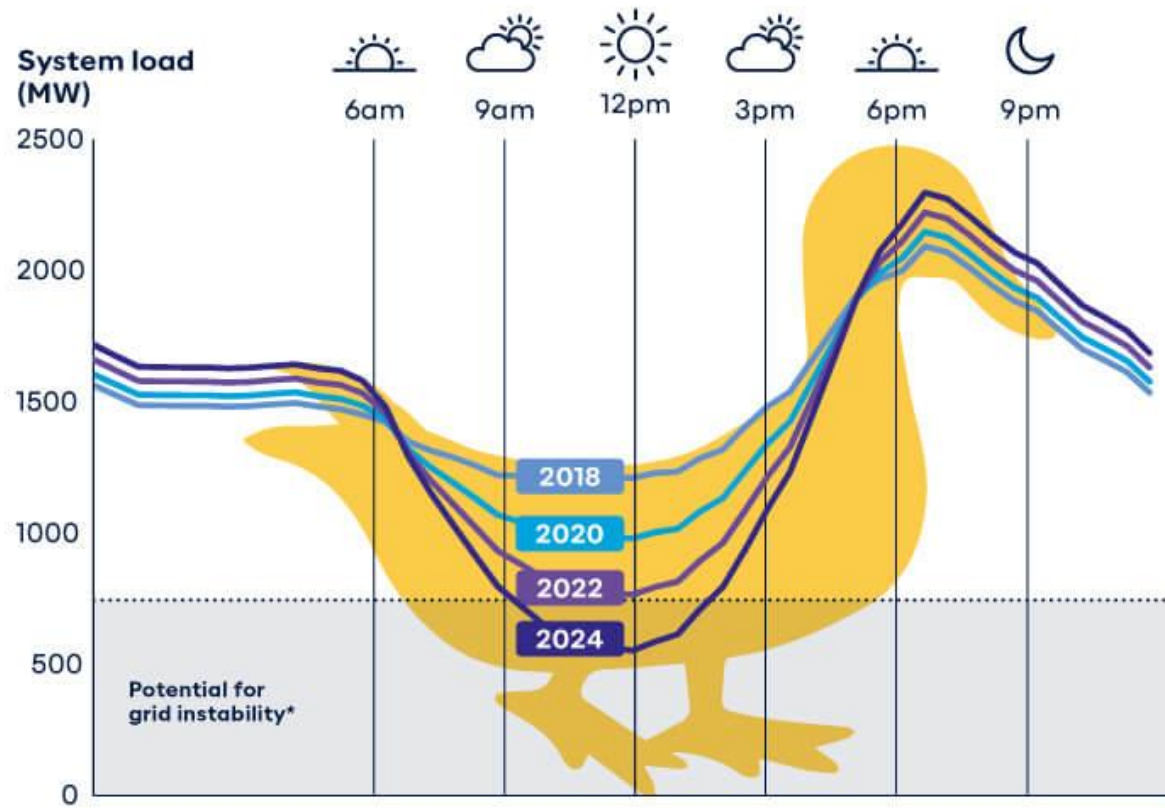


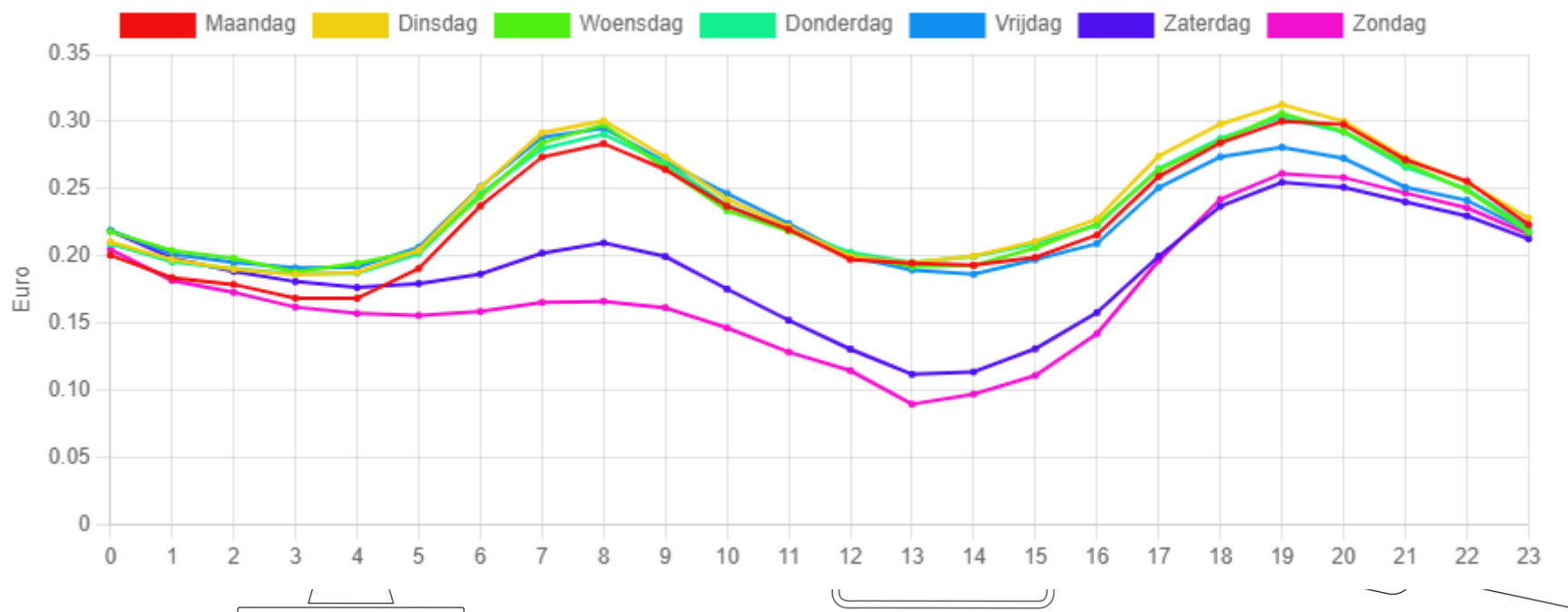
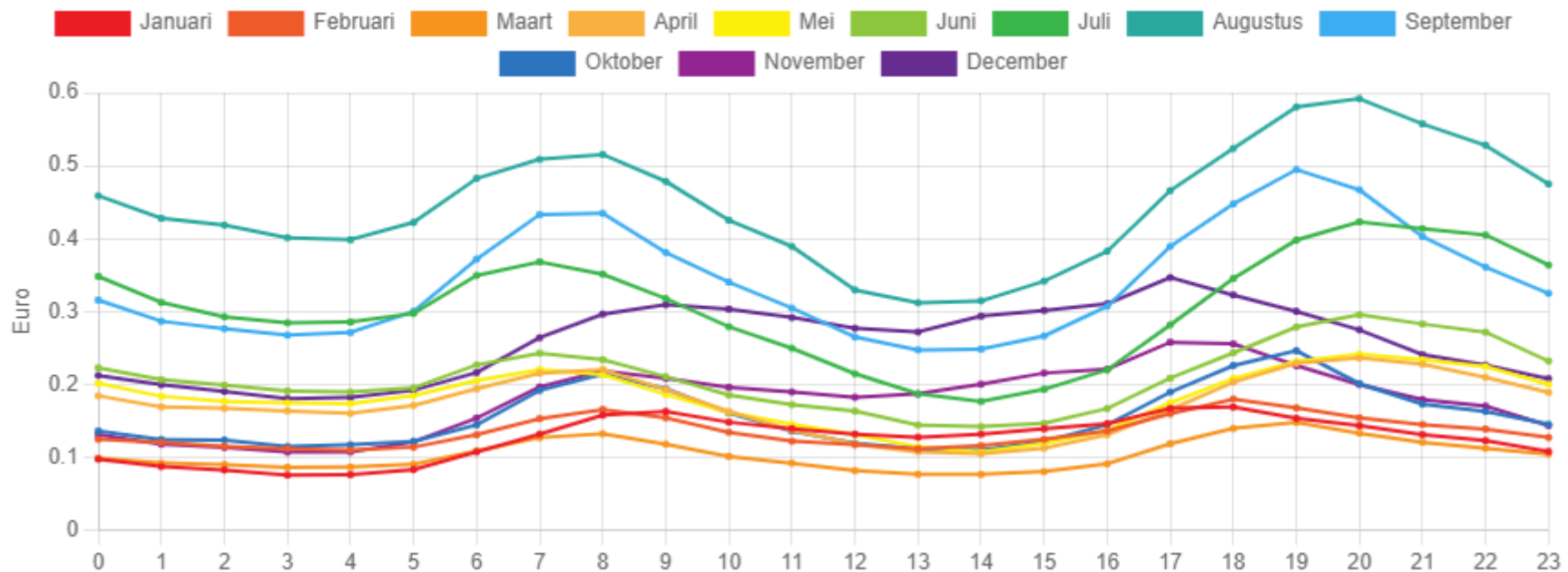
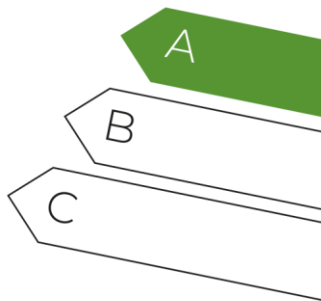
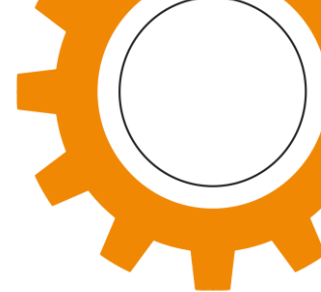
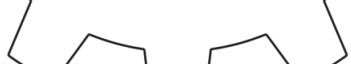
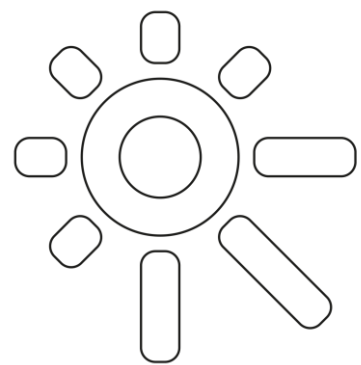
The Duck Curve

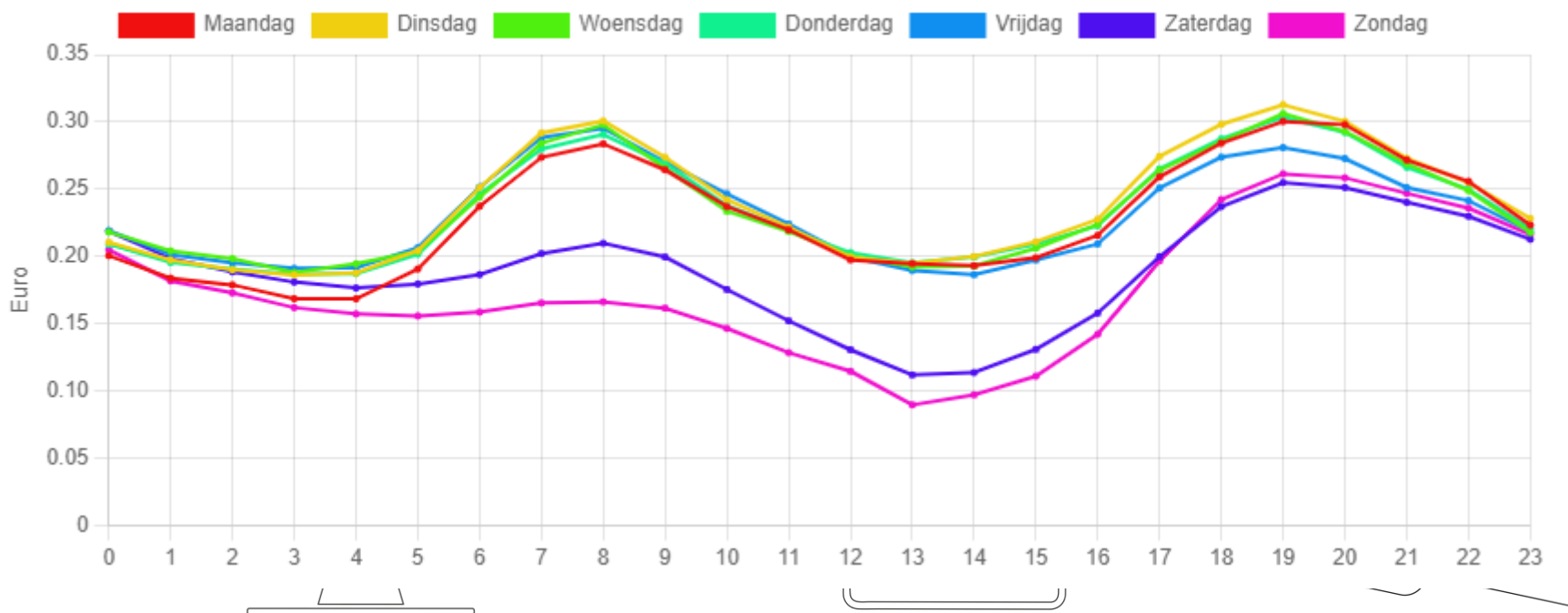
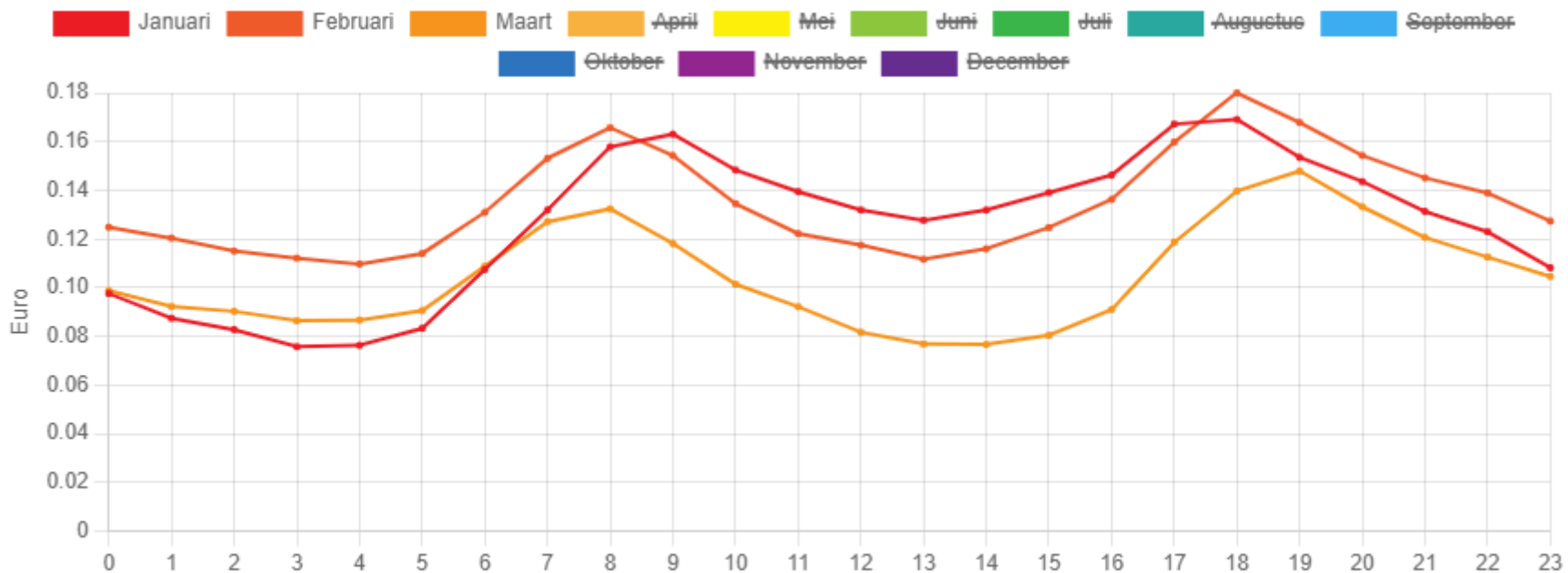
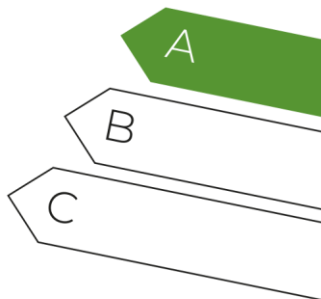
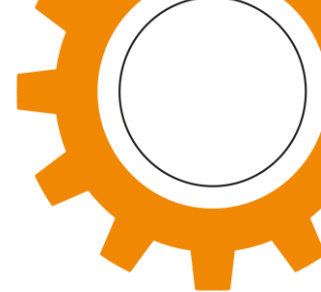
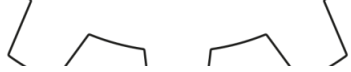
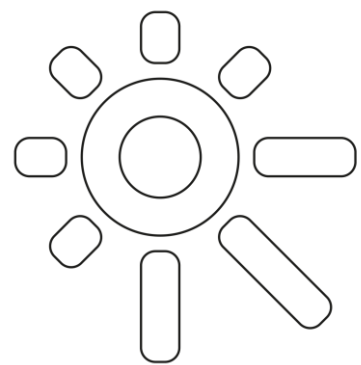
A DAY IN THE LIFE: MAY 1, 2021

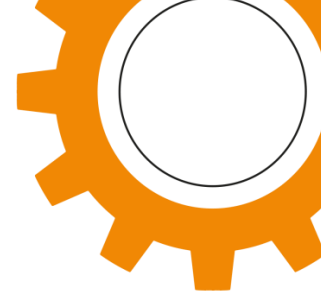
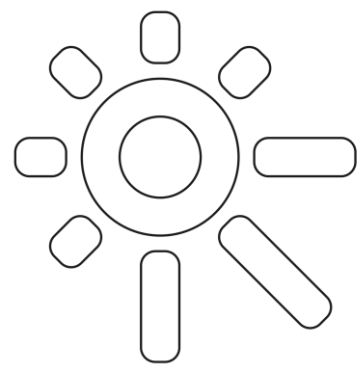


1 From California Independent System Operator (ISO)
 2 System demand minus wind and solar from California Independent System Operator (ISO)
 3 Costs per megawatt hour from Palo Verde Generating Station hourly index. CAP purchases energy based on these prices, and not exactly at those listed.

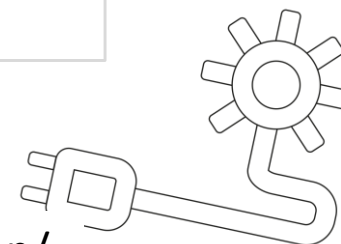
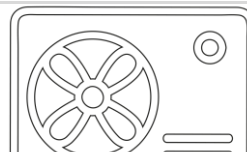
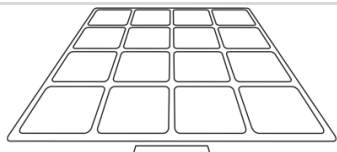
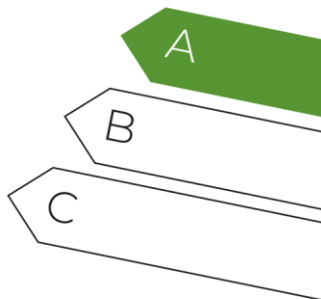
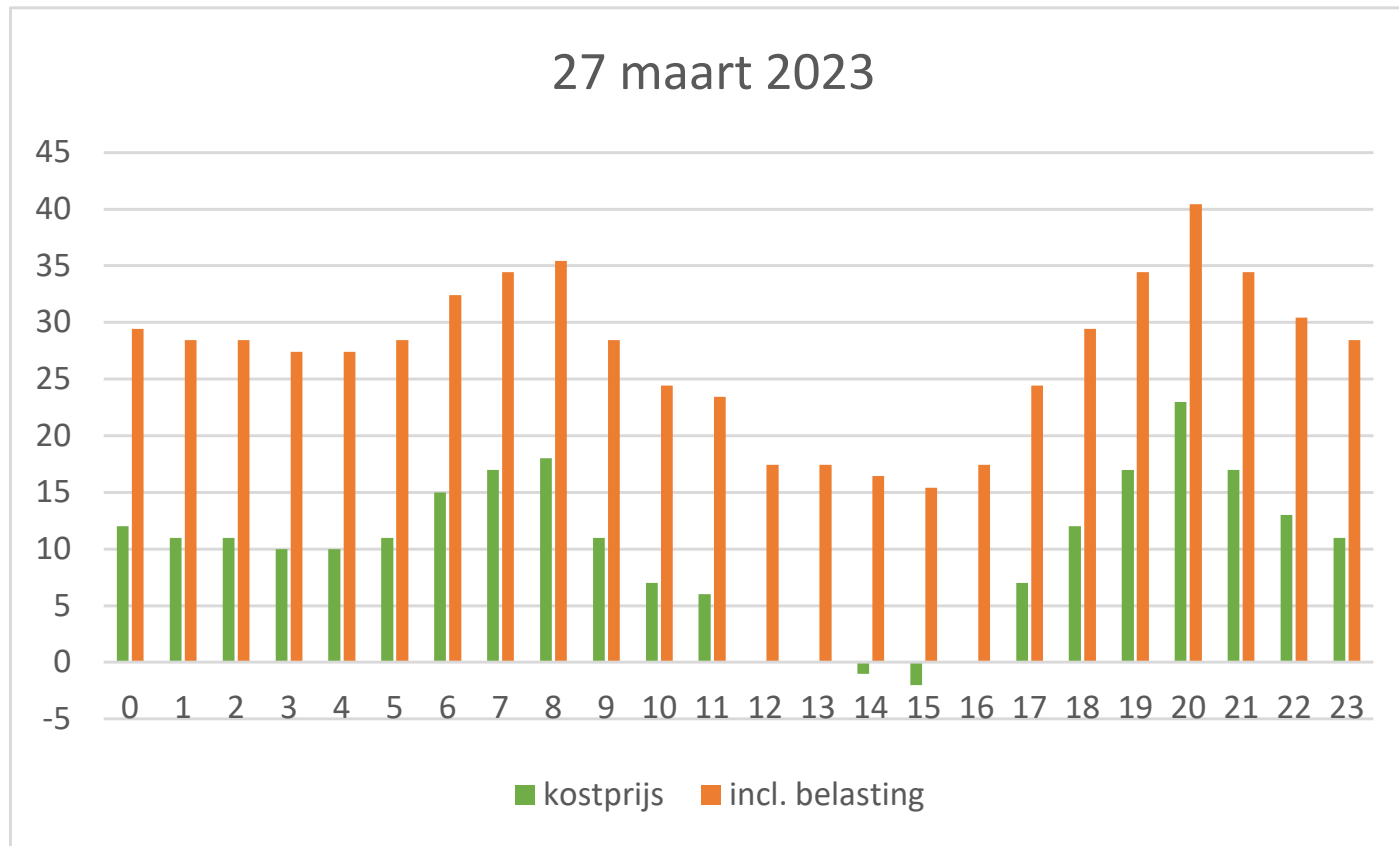
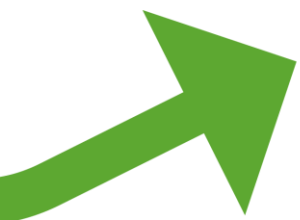


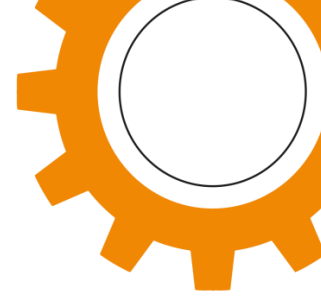
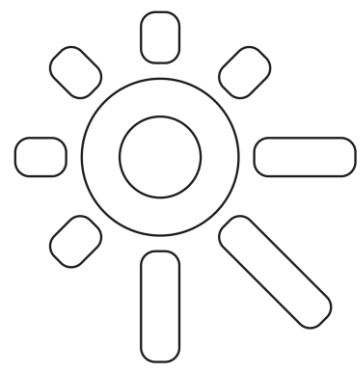






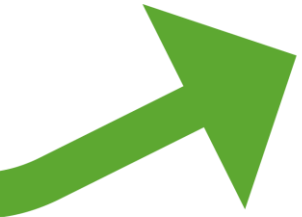
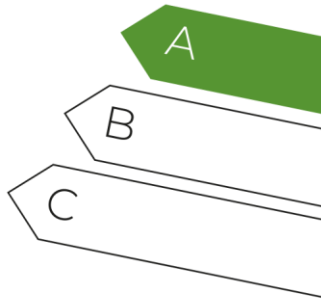
Een paar dagen geleden...



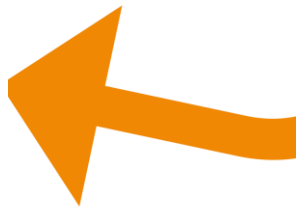


2025

- Salderingsregeling wordt afgebouwd
- Moet nog naar 1^{ste} kamer
- 6 jaar, tot 2031
 - Redelijke terugleververgoeding? 80% levertarief?



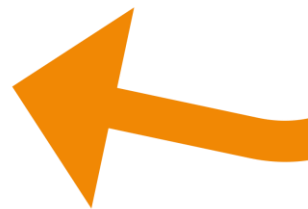
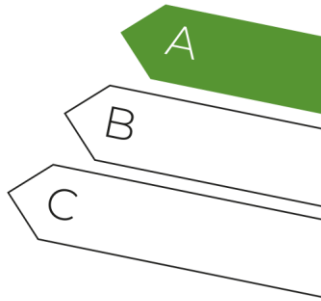
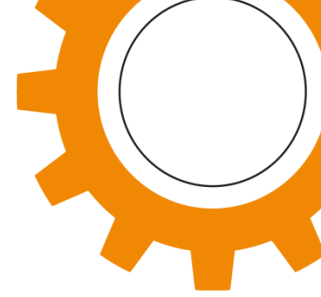
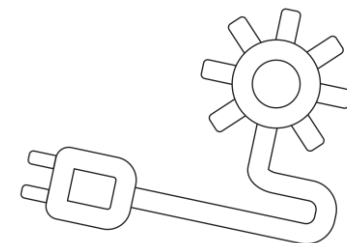
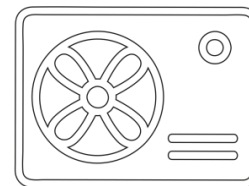
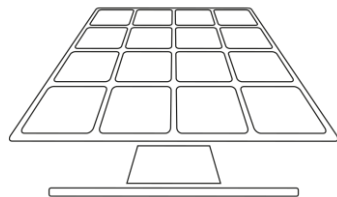
| | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|---|------|------|------|------|------|------|------|------|------|------|
| Oorspronkelijke afbouw saldering (%) | 100 | 91 | 82 | 73 | 64 | 55 | 46 | 37 | 28 | 0 |
| Huidige plan voor afbouw saldering (%) | 100 | 100 | 100 | 64 | 64 | 55 | 46 | 37 | 28 | 0 |
| Amendement voor afbouw saldering (%) | 100 | 100 | 100 | 63 | 56 | 49 | 42 | 33 | 27 | 0 |





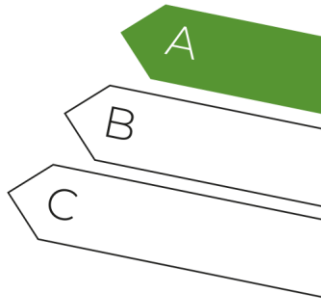
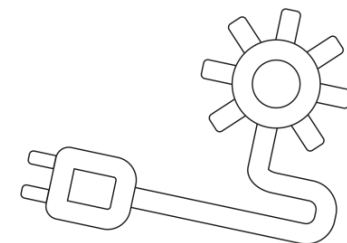
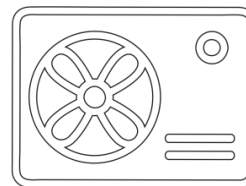
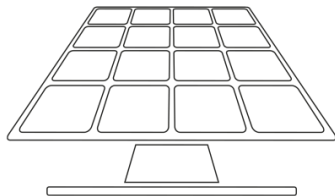
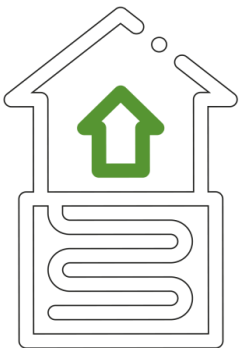
Heeft u zonnepanelen

- Levert u te veel
 - Wat is de + terugleververgoeding?
- Levert u minder dan u nodig heeft
 - Wat is het tarief?



Heeft u een Elektrische Auto

- Van de (eigen) baas/lease
 - Wie betaalt het?
- Van privé
 - Verder uitzoeken, veel werk



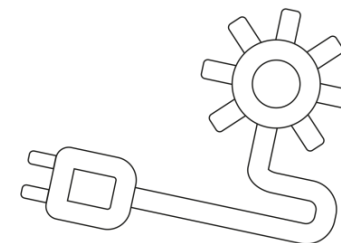
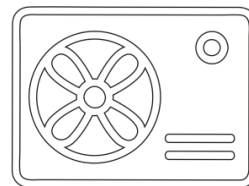
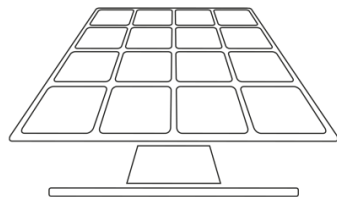
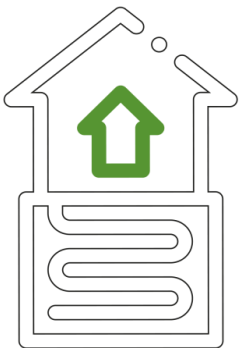
Tabel, die nooit klopt: uzelf bent anders!



| | Geen PV | ZON Over | ZON tekort | Electro-Auto Warmtepomp |
|----------|---------|----------------------|------------|----------------------------|
| vast | - | terugleververgoeding | 0 | - |
| variabel | 0 | terugleververgoeding | 0 | - |
| flex | ++ | - | 0 | + |

- **Keuze: Vergt uitzoekwerk**

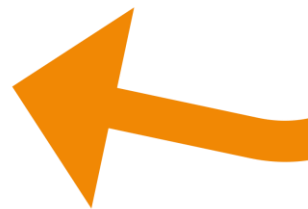
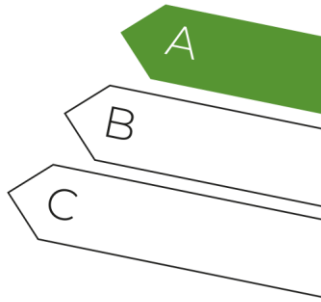
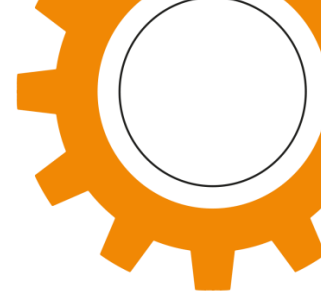
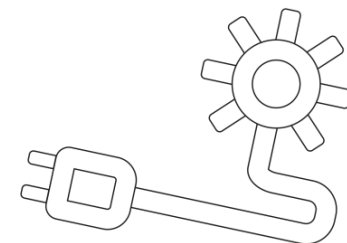
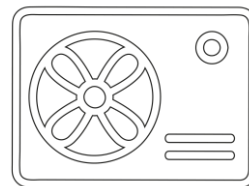
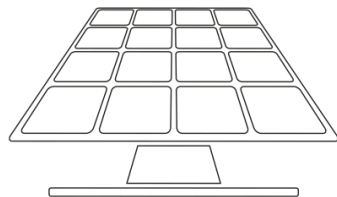
- hoe flexibeler u zelf bent hoe flexibeler het contract kan zijn

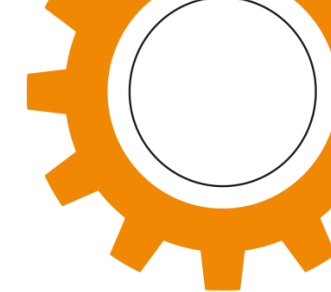
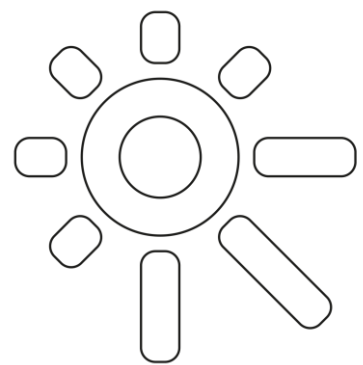




Verdiepingsonderwerpen

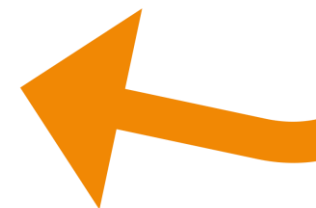
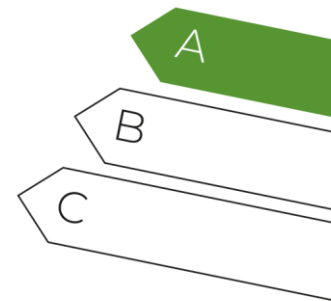
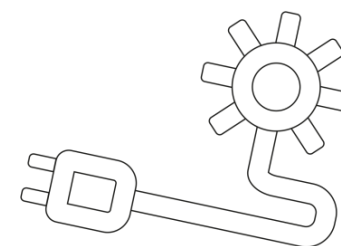
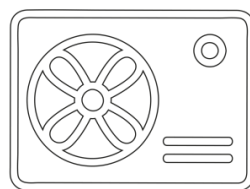
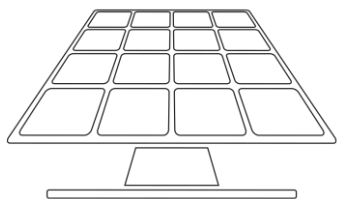
- 
- Isoleren
 - Ventilatie
 - Zonnepanelen
 - Kleine Maatregelen
 - Warmtepomp
 - Lage Temperatuur Verwarming
 - Kierdichting en Tocht
 - Meten en Monitoring

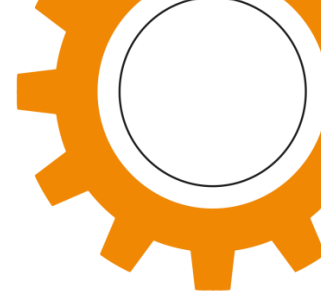
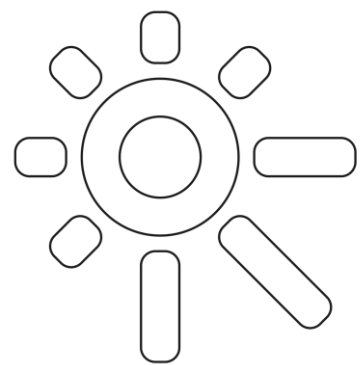




Energieke Avond

- Warmtesysteem
- Optimalisatie CV-ketel
- Waterzijdig inregelen
 - Principe
 - Zuiniger voor gasketel en warmtepomp
 - Met inregelventielen
 - Praktische alternatieven
 - Temperatuurverschil
 - Retourtemperatuur
- Pompstand
- Brandervermogen
- Nadraaitijd
- Lage Temperatuur Verwarming
 - Overcapaciteit
 - Boost met ventilatoren
 - Wand, vloer, plafond





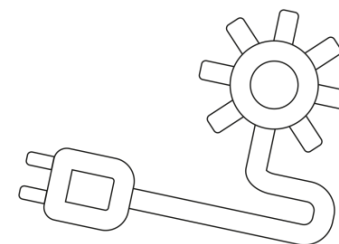
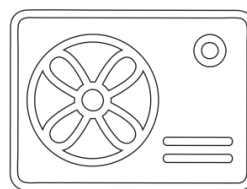
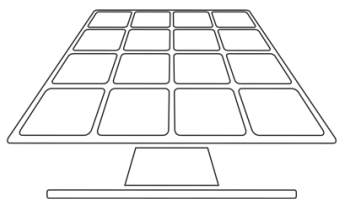
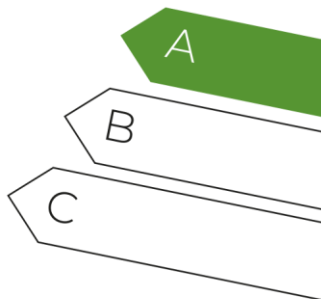
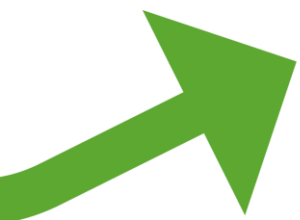
Warmte systeem

- Radiator vs Vloerverwarming

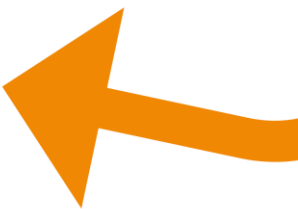
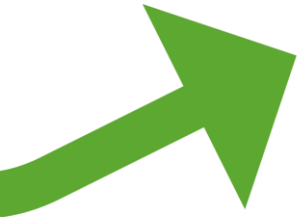
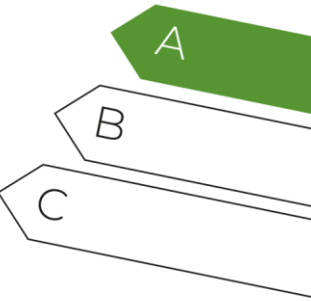
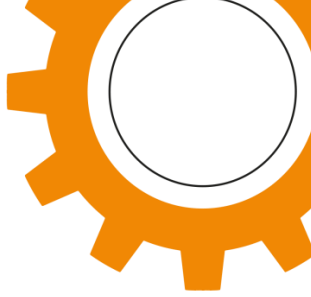
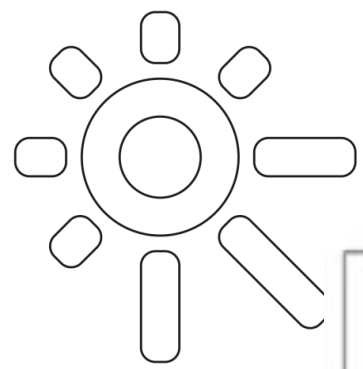
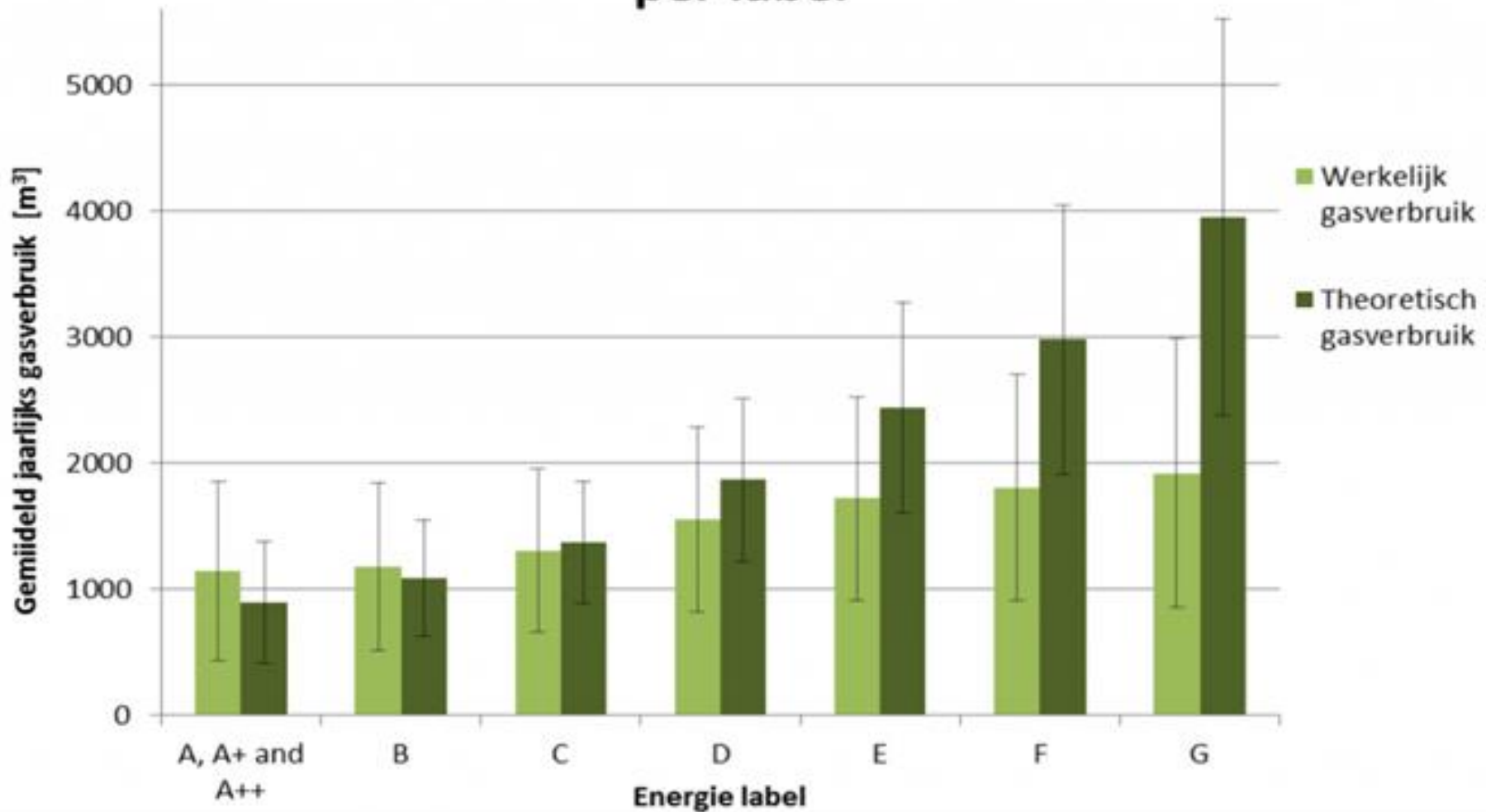
- Klein heet (>40gr) vs groot warm (<35gr)
- Slecht vs Goed geïsoleerd
- F labels vs A+label
- Tochtig vs geregelde ventilatie

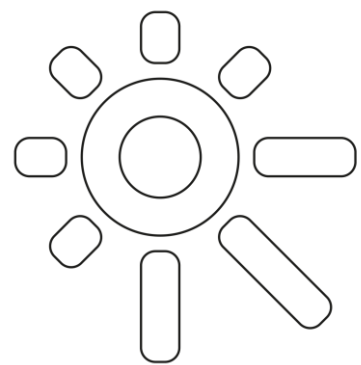
- Buiten is het -10

- Hoe kouder hoe duurder
- Maar B is duurder dan A



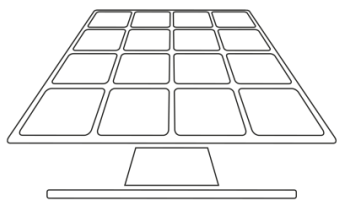
Werkelijk en theoretisch gasverbruik in woningen per label



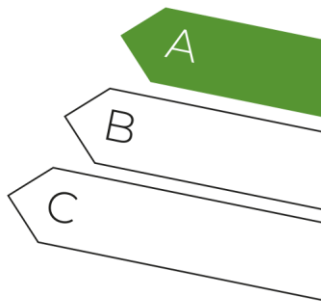
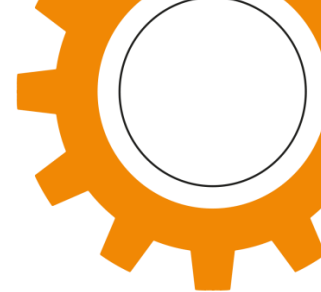
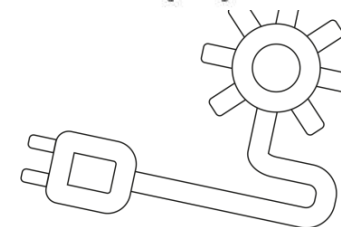
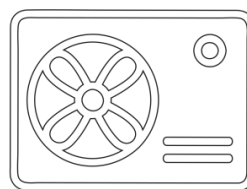
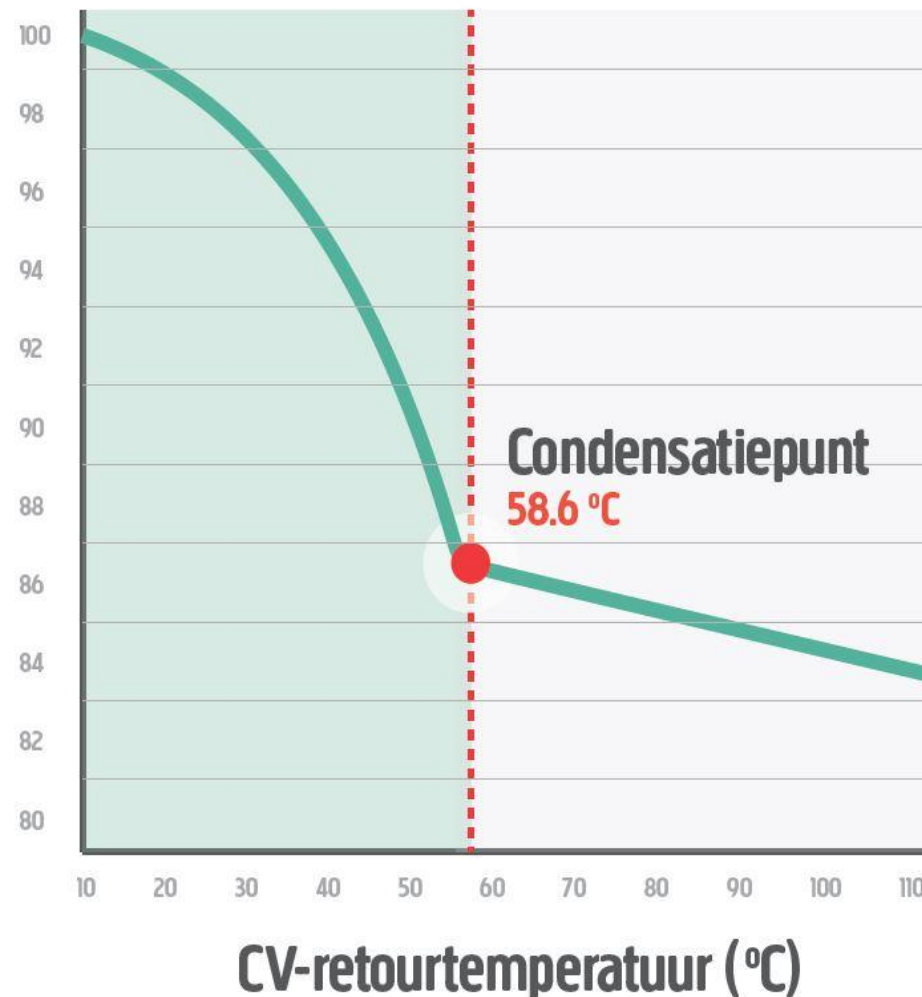


Ketelrendement

- 1 m³ gas = 9,77kWh
- HR Ketel:
 - 30gr 97%
 - 60gr 86%
 - 11% verschil
- Retourtemp verlagen = **besparen!**
 - 960 m³ of 860 m³
 - 100 m³ verschil = € 300/j




Ketelrendement (%)





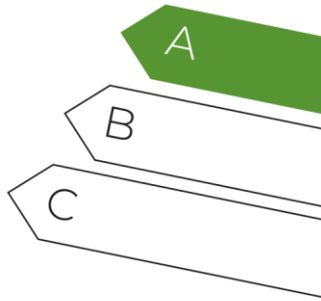
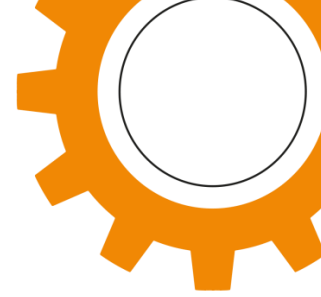
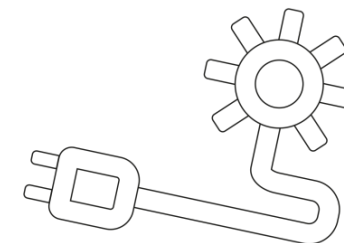
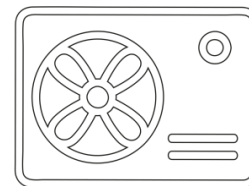
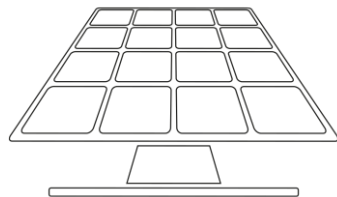
Besparen op verwarming

Focus verwarmde ruimtes

- 
- Deurdrangers
 - Goed gebruik gordijnen: zon, radiator
 - Ventileren: luchtvochtigheid
 - Folie voor de ramen bij enkel en oud-dubbel-glas
 - Nachtverlaging

Verwarmings installatie

- Isoleer CV-leidingwerk
- Aanvoertemperatuur omlaag, pomp standje omhoog
- Ontluchting radiatoren
- Waterzijdig inregelen
- Radiatorventilatoren
- Radiatorfolie



Waterzijdig Inregelen?

Kenmerk:

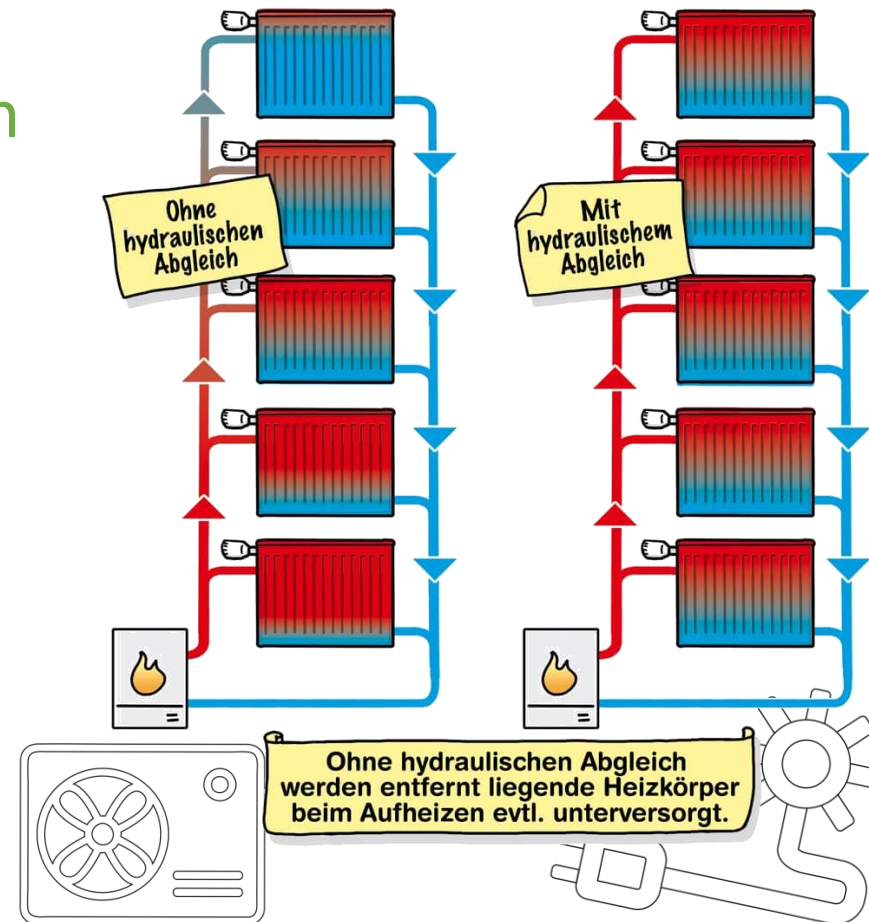
De radiatoren worden niet even warm:

Dichtbij = te heet en te snel

Veraf = te koud en te langzaam

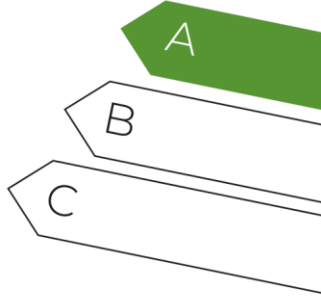
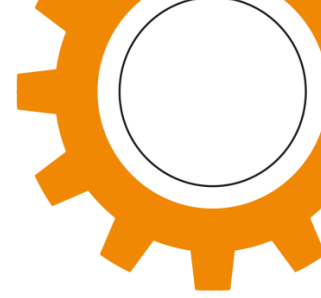
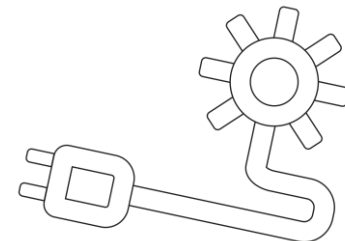
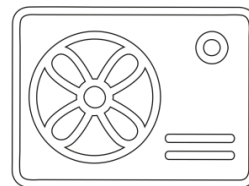
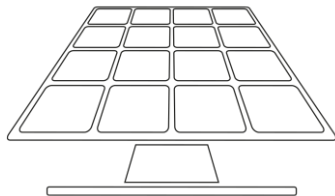
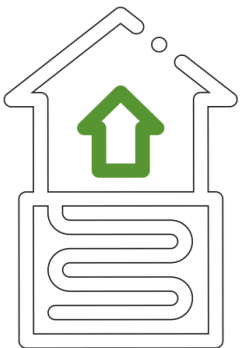
Radiator in de verste kamer,
op zolder of de kelder

Gleichmäßige Erwärmung
durch hydraulischen Abgleich



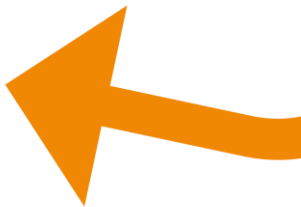
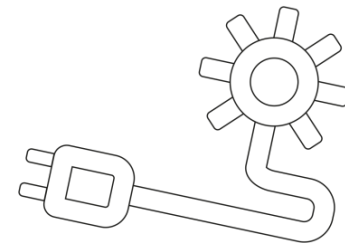
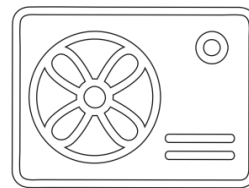
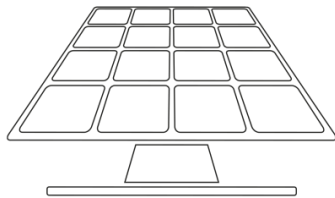
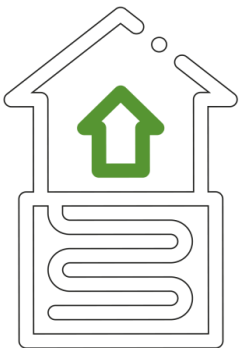
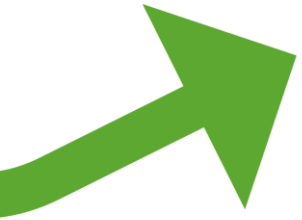
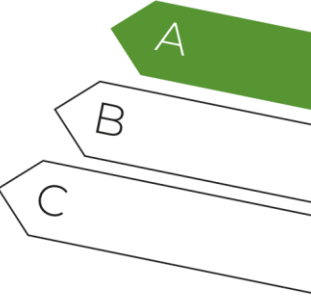
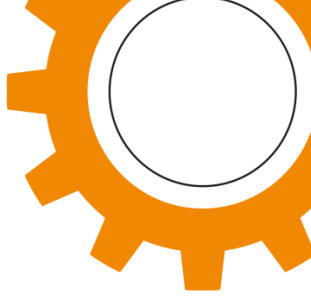
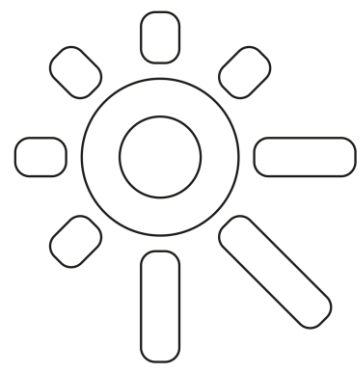
20% besparing én verhogen comfort

- **Systeem vaker níet dan wél goed ingeregeld: inefficiënt**
 - Signalen van inefficiënt systeem:
 - tikken, fluiten,
 - radiator op zolder wordt niet warm,
 - even warme aanvoer- als retourbuizen,
 - temperatuurschommelingen
- **Goedkoop en brengt veel comfort**
 - Maximale vermogen afgeven van alle radiatoren: geen tocht
 - Goed afgestelde HR ketel: 10% besparing!



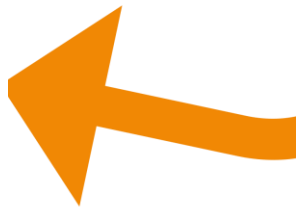
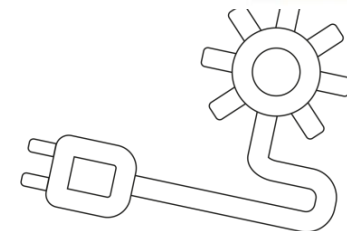
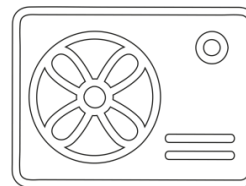
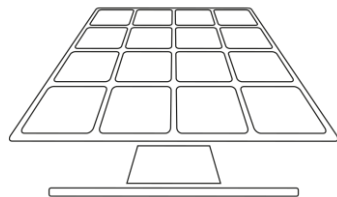
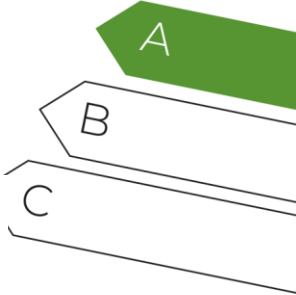
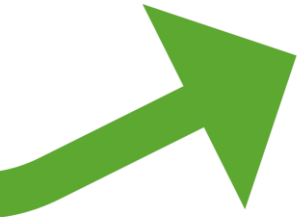
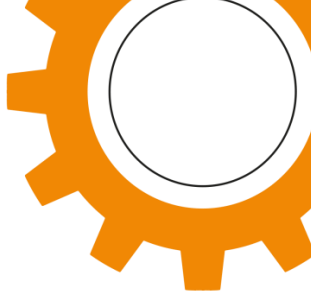
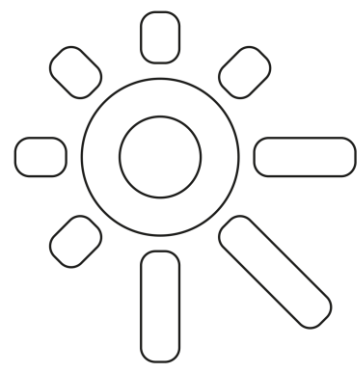
Waterzijdig inregelen (PPP©)

- Vroeger: complex en tijdrovend werk
 - Met temperatuursensoren alle ventielen zorgvuldig instellen
- Tegenwoordig: eenvoudiger
 - Constante flow ventielen (bijv. Heimeier Eclipse)
 - Constante druk pompen
- Hoe dan?
 - HyToolsApp voor de juiste instellingen (kamergröte, radiator type, $T_{aanvoer}$, T_{retour})
 - Gasketel instellen op juiste druk curve en temperatuur
 - Door installateur, kosten: ventielen en arbeidsloon



Zelf waterzijdig inregelen

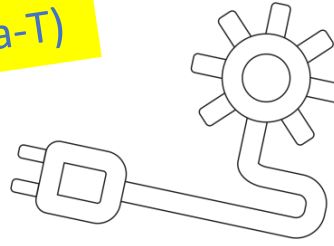
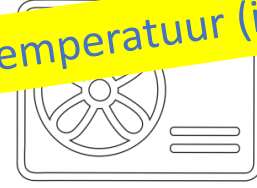



- Gebruik van bestaande kranen, voetventielen en andere instelmogelijkheden
- Temperatuurmeting nodig
 - IR-pistool, oorthermostaat, contacttemperatuursensor, (warmtebeeldcamera)
- Enigszins tijdrovend, net als vroeger
 - 2 tot 3x alle radiatoren langslopen



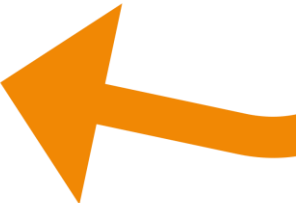


Stappenplan

- **Beginsituatie: alle kranen/ventielen open**
 - Noteer de ingaande en uitgaande temperatuur bij elke radiator
 - Bereken het temperatuurverschil, delta-T
- **Draai het ventiel een stukje dicht van de radiator met het kleinste verschil**
 - Zorg dat alle radiatoren ongeveer het zelfde temperatuurverschil krijgen.
 - De radiator(en) met het grootste verschil blijven helemaal open!
- **Geef het systeem minimaal 15-30 minuten de tijd om zich aan te passen**



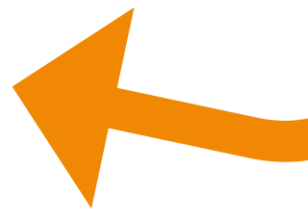
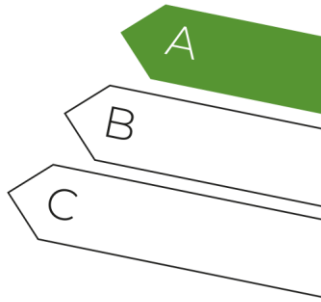
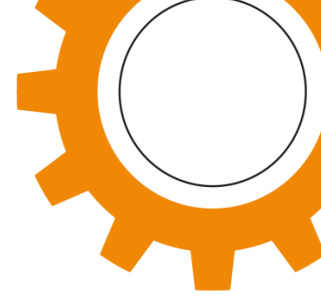
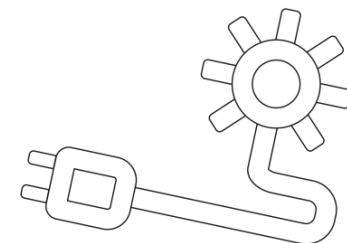
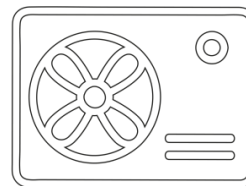
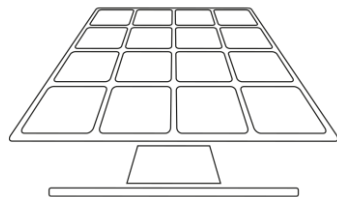
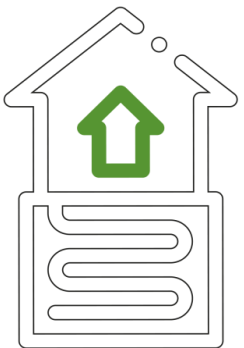
Alternatief = gelijke, lage retourtemperatuur (ipv gelijke delta-T)





Richtlijnen

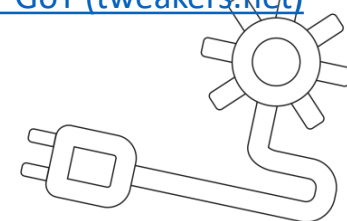
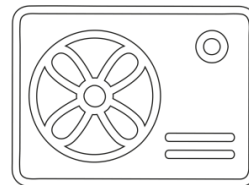
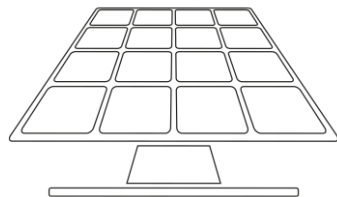
- Hoe hoger de stooktemperatuur, hoe hoger de delta-T
 - $80 \rightarrow 60 = 20$ graden
 - $50 \rightarrow 40 = 10$ graden
 - $35 \rightarrow 30 = 5$ graden
- Is de delta-T veel hoger of lager?
 - Pas de snelheid van de CV-pomp aan
 - Meer snelheid = lagere dT
 - Minder snelheid = hogere dT



Goed ingeregeld? Ga verder ...

- Bespaar nog meer en maak het nog comfortabeler met:
 - Verlagen van de aanvoertemperatuur
 - Reduceren van het (minimale) brandervermogen
 - Instellen van een minimale nadraaitijd (bijv. 10 min)
 - Aanbrengen van ventilatoren, of vervangen van radiatoren door lage-temperatuur-radiatoren, of plaats extra radiatoren waar nodig
 - Modulerende en/of slimme thermostaat

Verder lezen: [Gas besparen door middel van CV tuning deel III - Duurzame energie en installaties - GoT \(tweakers.net\)](https://www.tweakers.net/got/gas-besparen-door-middel-van-cv-tuning-deel-iii-duurzame-energie-en-installaties)





Samenvatting

Optimalisatie CV-ketel

- Waterzijdig inregelen

- Principe

- Zuiniger voor gasketel en warmtepomp

- Met inregelventielen

- Praktische alternatieven

- Temperatuurverschil
 - Retourtemperatuur

- Pompstand

- Brandvermogen

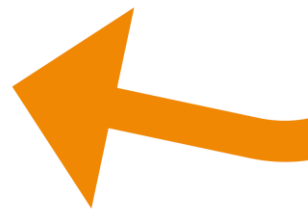
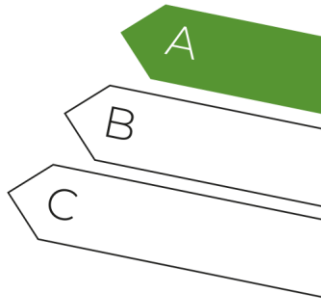
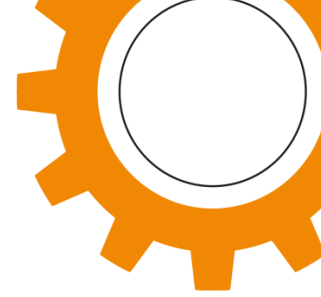
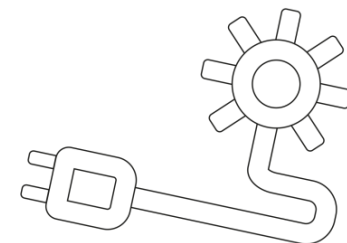
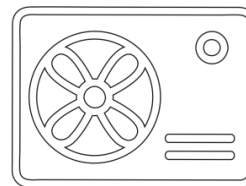
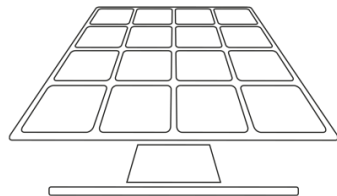
- Nadraaitijd

- Lage Temperatuur Verwarming

- Overcapaciteit

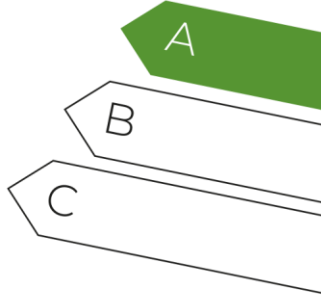
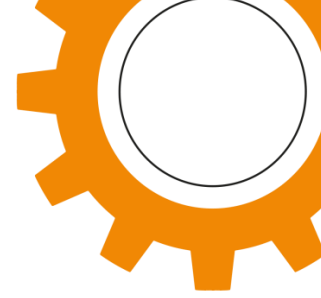
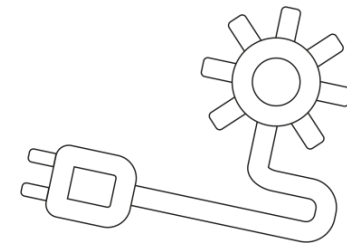
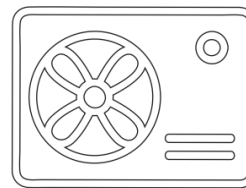
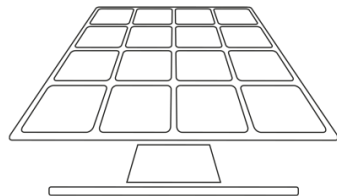
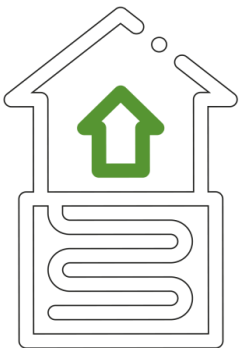
- Boost met ventilatoren

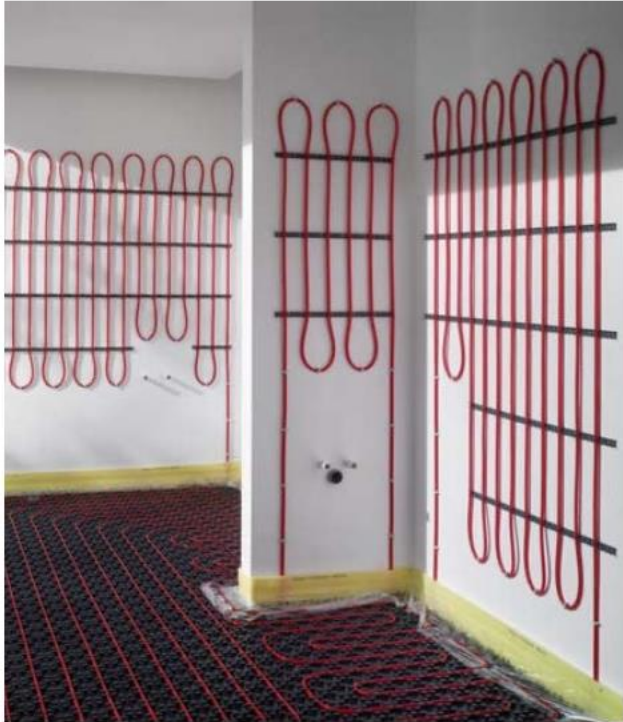
- Wand, vloer, plafond



Lagere temperatuur: stage lopen

- Vloerverwarming 'beneden' en 'boven' alles 'uit'?
 - =>Max 35gr
- Slecht geïsoleerd?
 - Probeer 40gr en langere looptijd
- Badkamer?
 - voor 1 uur het hele huis verwarmen, of . . .
 - infrarood paneel met timer/sensor
 - matje of sloffen
 - Douchen?
- Meten is weten: gebruik de gasmeterstanden:
 - spaarkop, pisstraaltje, korter/sneller? Schrijf het op!





Drie niveaus voor stooktemperatuur

- Hoge temperatuur: 56 – 90 graden
- Lage temperatuur: 35 – 55 graden
- Zeer lage temperatuur: tot 35 graden

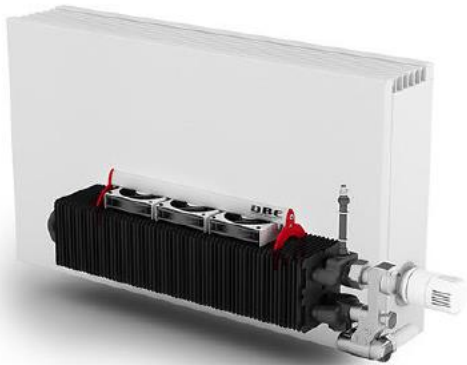
Soorten LTV verwarming

- Vloer- en wandverwarming
- Lage temperatuur radiatoren
- Overgedimensioneerde normale radiatoren
- Normale radiatoren met ventilatoren

Test je radiatorcapaciteit met de 50 graden test

Voordelen LTV

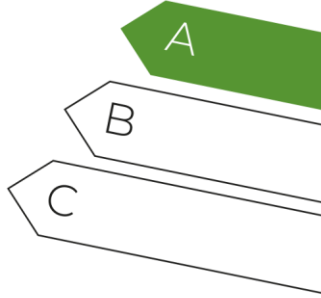
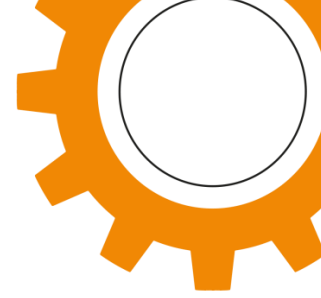
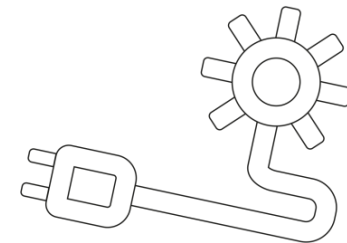
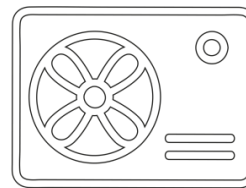
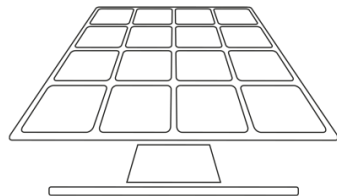
- Voorwaarde voor warmtepomp
- Ook bij gasketel besparing

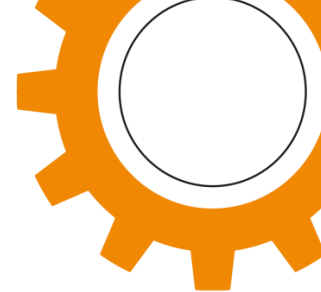
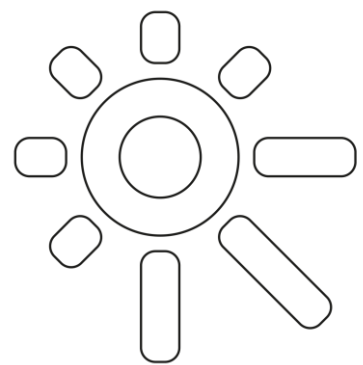




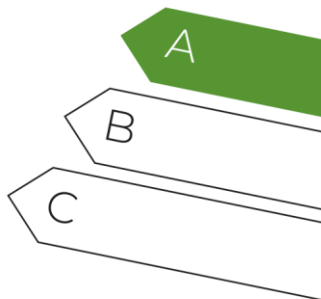
Radiatorventilatoren?

- Climatebooster, Speedcomfort, Heatfan
 - Zeer zuinige en relatief stille ventilatoren
 - Verbeteren de warmteafgifte met wel 50%
 - Sneller door actieve luchtstroming
 - Claims van 22-35% gasbesparing:
 - Modulerende ketel/thermostaat, laaglast is zuinigste
 - Verlaging aanvoertemperatuur, meer condensatiewinst
 - Minder stop/start verliezen en transportverlies
 - Waterzijdig inregelen






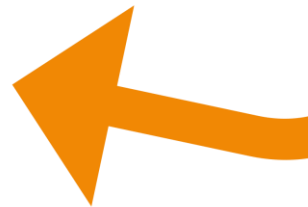
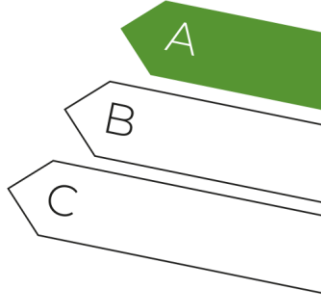
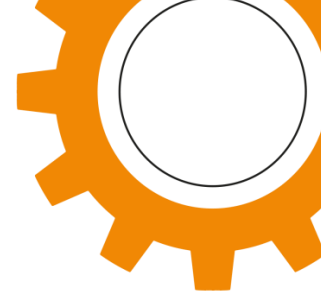
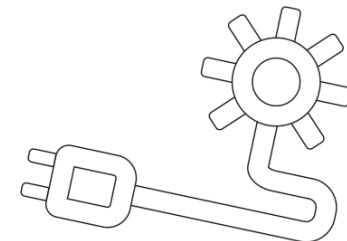
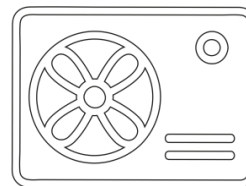
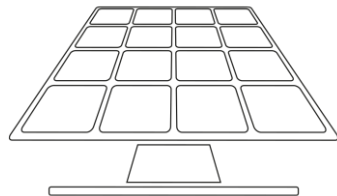
Keteltemperatuur instellen

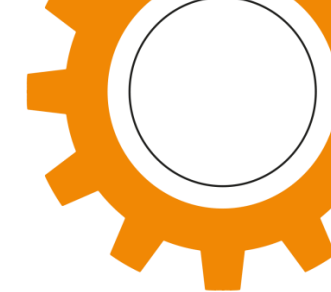
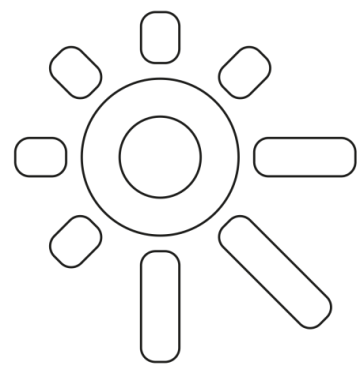




Ventilatie en tocht

- 
- Wapperende gordijnen?
 - Isolerende gordijnen
 - Kieren in huis dichten
 - Ga op kierenjacht
 - Ventileren moet!
 - Vocht in huis moet weg kunnen
 - CO₂ gehalte verlagen: frisse geur, gezond klimaat

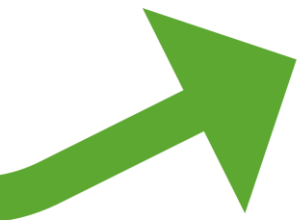
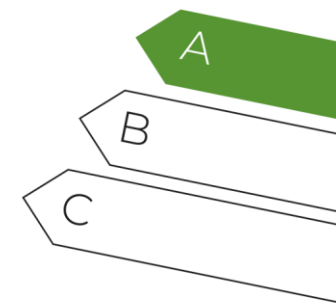




Kieren en Tocht

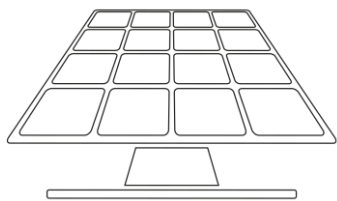
- Tochtstrippen

- Diverse soorten
- Liefst vol rubber



- PUR

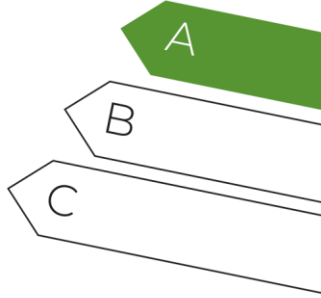
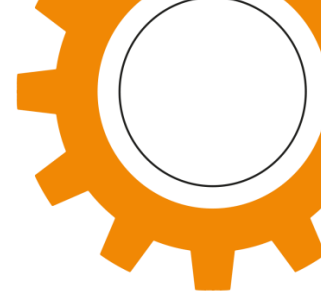
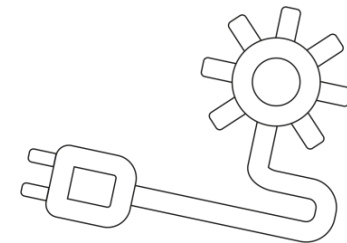
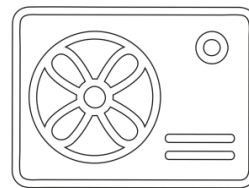
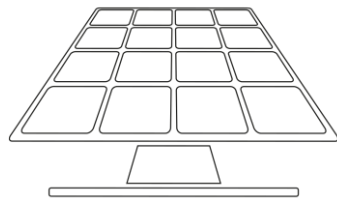
- Grote kieren en openingen
- Vooral op zolder
- Permanente roosters

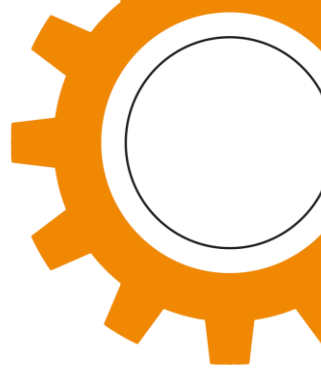
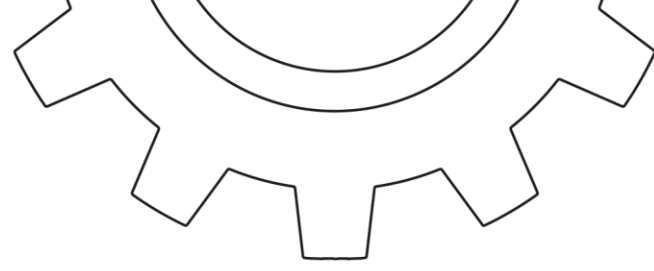
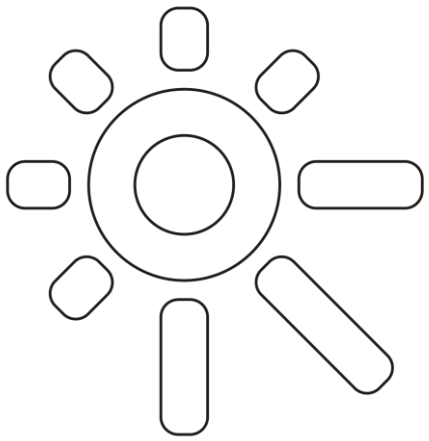




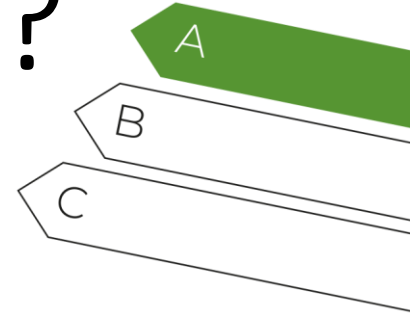
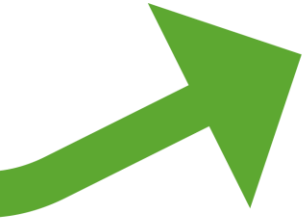
Verdiepingsonderwerpen

- 
- Isoleren
 - Ventilatie
 - Zonnepanelen
 - Kleine Maatregelen
 - Warmtepomp
 - Lage Temperatuur Verwarming
 - Kierdichting en Tocht
 - Meten en Monitoring

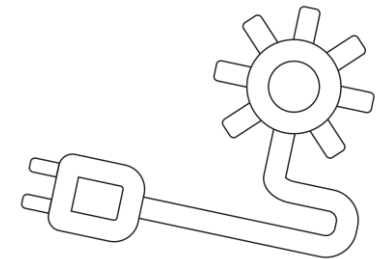
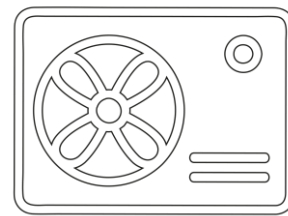
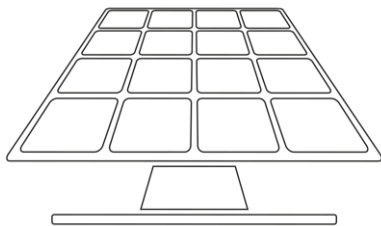
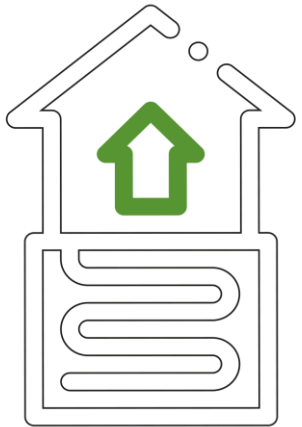




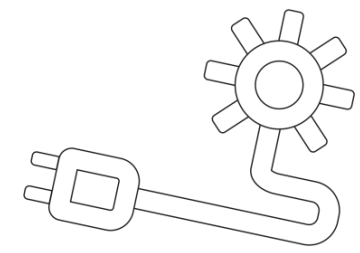
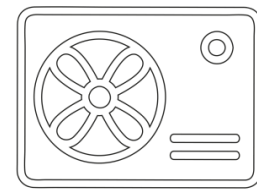
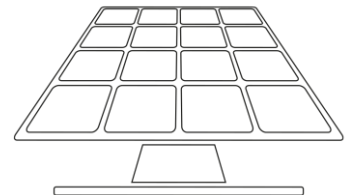
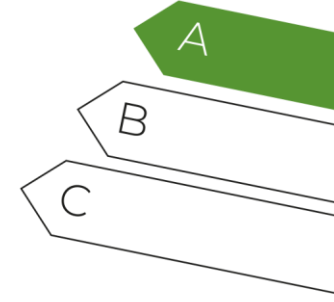
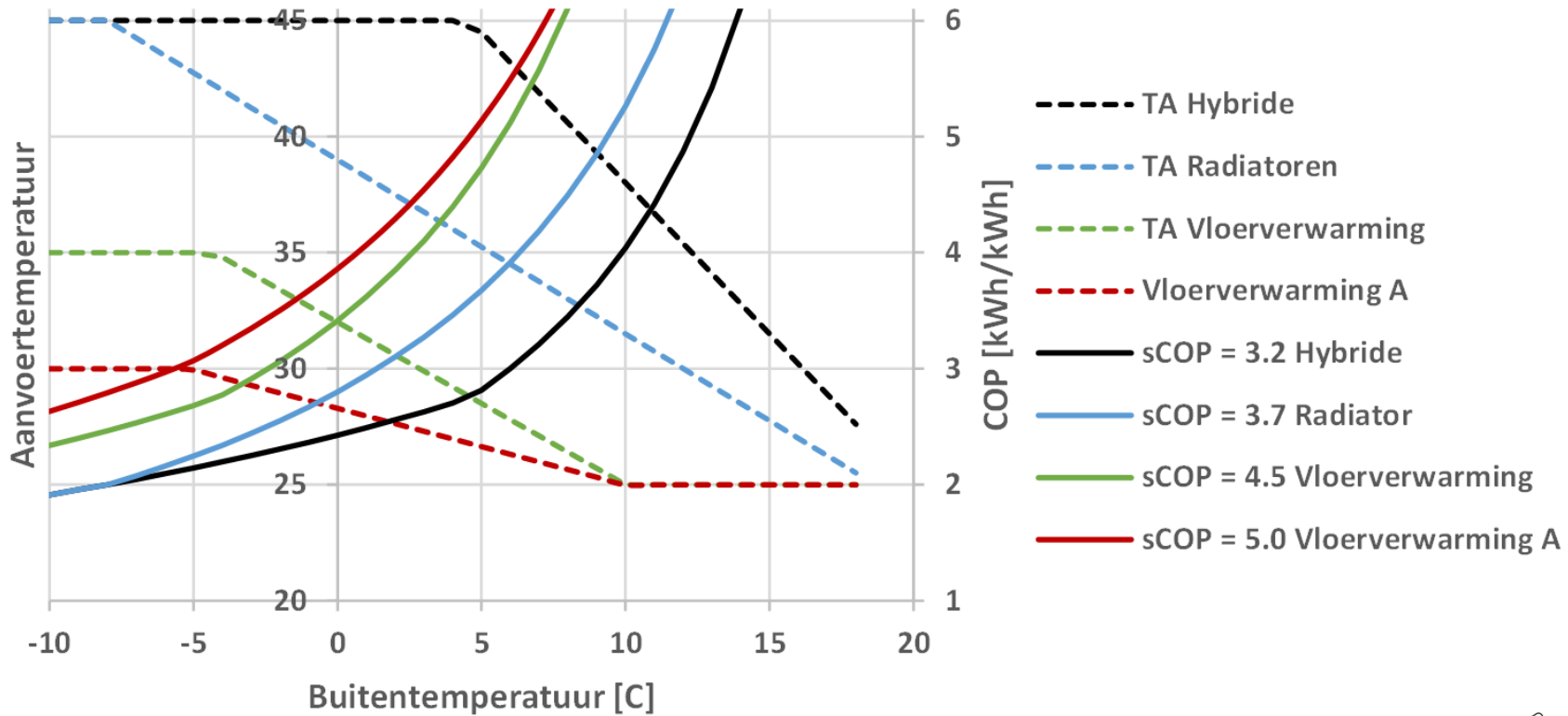
Maakt u de Omslag met ons?



Wordt Lid



COP Warmtepomp





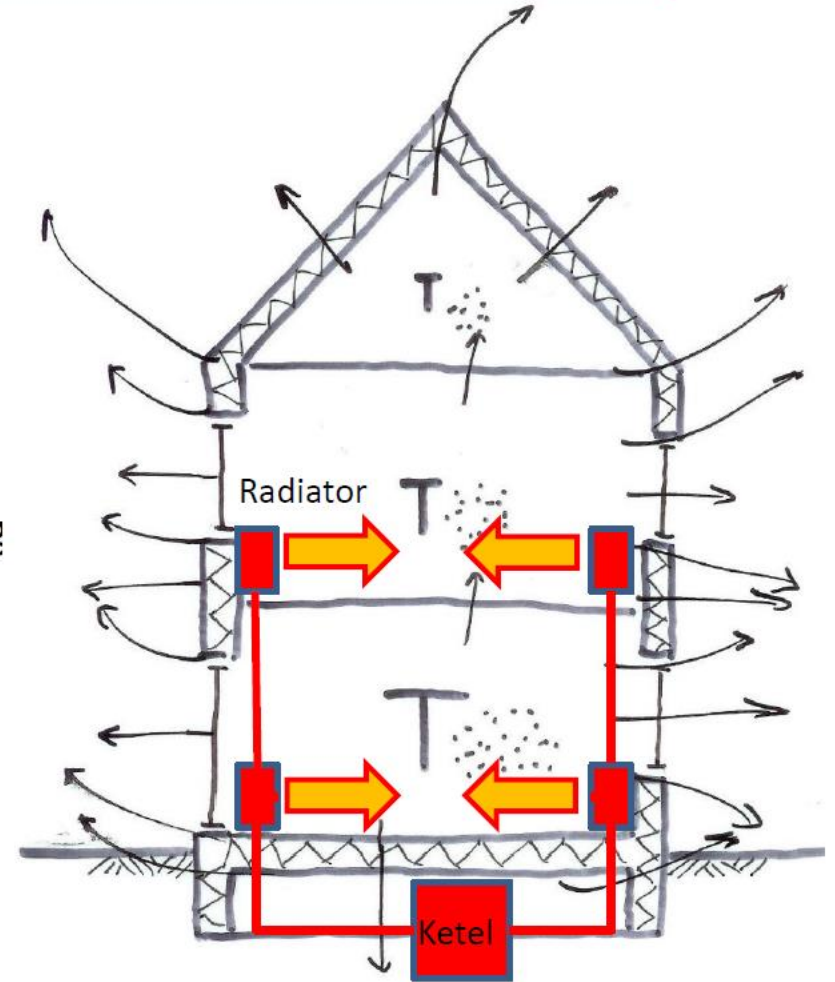
| GASKEUR | | |
|------------------|--------------------------|-----|
| HR | HR Verwarming | 107 |
| HR _{ww} | HR Warm Water | |
| CW | Comfort Warm Water | 6 |
| SV | Schonere Verbranding | |
| NZ | Naverwarming Zonneboiler | |

Componenten

- Ketel
- Rookgasafvoer
- Expansievat
- Condensafvoer
- Gas- en elektra-aansluiting
- Radiatoren en/ of vloerverwarming

Werking

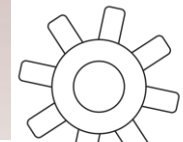
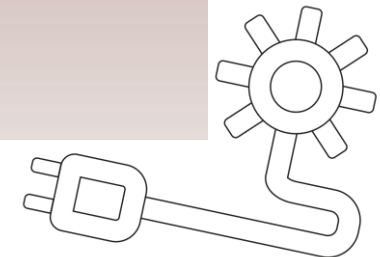
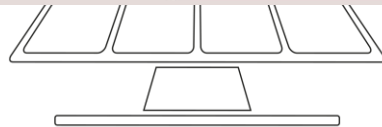
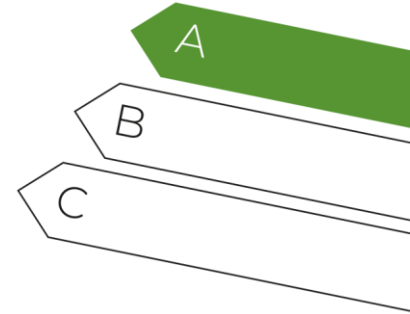
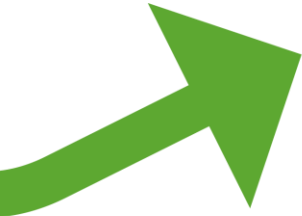
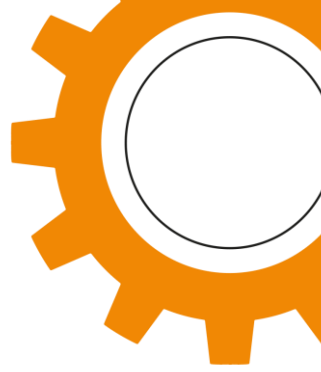
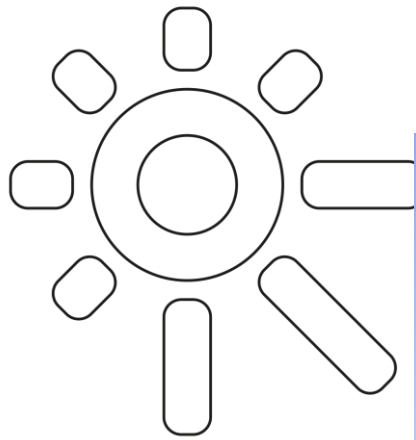
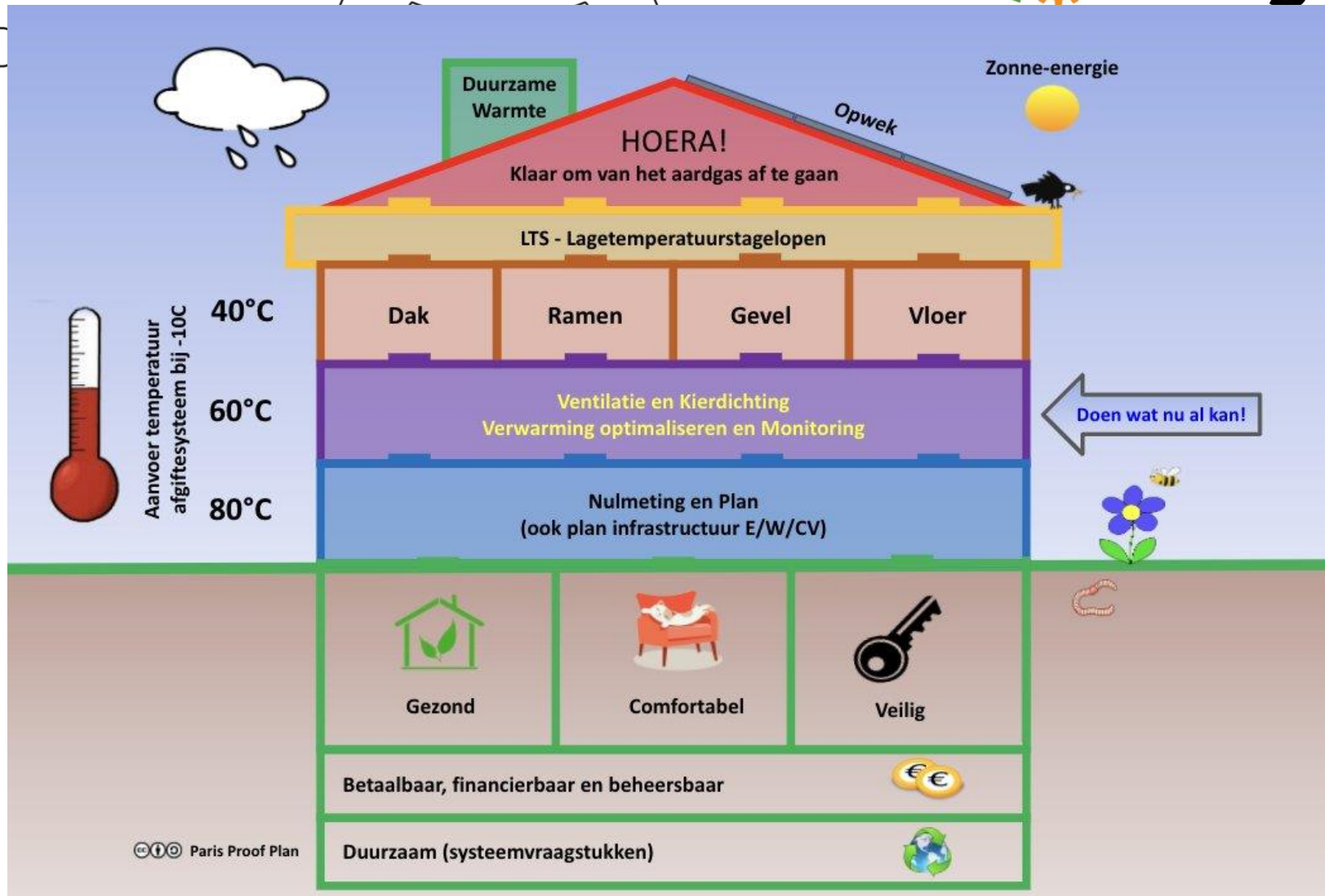
- Opwarmen van (cv-)water door verbranden van gas
- Combiketels voor verwarming en warm tapwater
- Extra efficiëntie door condensatie van de rookgassen
- Efficiënter bij lage stooktemperaturen

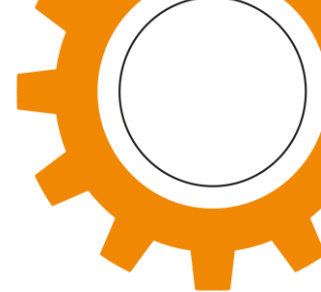
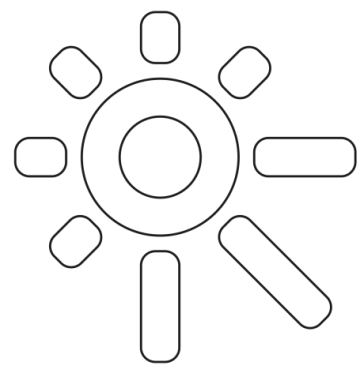


Types cv-ketels

- CR ketel
- VR ketel
- HR ketel

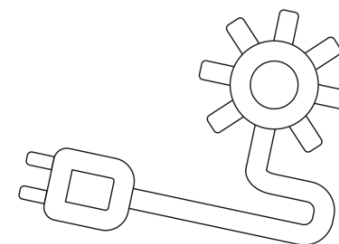
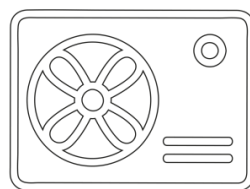
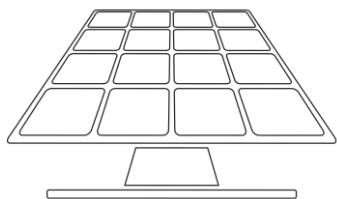
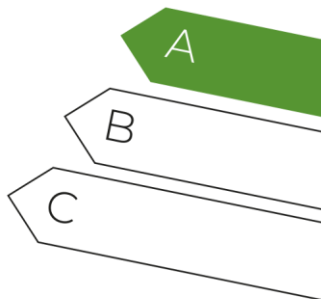
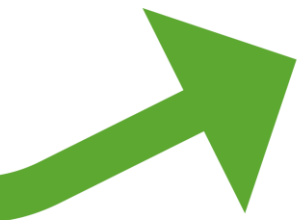






Kierdichting

- Teveel ventilatie = onnodig warmteverlies
 - Afstellen ramen/deuren, vervang oude rubbers
 - Extra tochtschuim/rubber waar afstellen niet helpt
 - Brievenbus: tochtborstel, Homebox, buiten?
 - Dakdoorvoer CV, ventilatie, rioolontluchter
 - Houtkachel/openhaard
 - Kieren en naden bij overgangen:
 - Kozijn/muur, muur/dak, kozijn/vensterbank
 - Materiaal: acryl/siliconenkit, flexibel PUR-schuim, (vloeibaar)rubber, luchtdichte tape



EXPLAIN HOW A HEAT PUMP WORKS LIKE I'M A 5 YEAR OLD

