Eff Photovoltaic panels

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Learn all about solar panel efficiency: How high-efficiency solar panels stack up against each other and what factors impact efficiency.

NLR maintains a chart of the highest confirmed conversion efficiencies for research cells for a range of photovoltaic technologies, plotted from 1976 to the present.

In this article, we will do a deep and detailed analysis of what is a PERC solar panel, how it compares to older and other advanced technologies, ...

Factors Affecting Conversion EfficiencyDetermining Conversion EfficiencyAdditional InformationNot all of the sunlight that reaches a PV cell is converted into electricity. In fact, most of it is lost. Multiple factors in solar cell design play roles in limiting a cell"s ability to convert the sunlight it receives. Designing with these factors in mind is how higher efficiencies can be achieved. 1. Wavelength--Light is composed of photons--or p...See more on energy.gov #b_results li.b_ans.b_mop.b_mopb,#b_results li.b_ans.b_nonfirsttopb{border-radius:6px;box-shadow:0 0 0 1px rgba(0,0,0,.05);margin-top:12px;margin-bottom:10px;padding:15px 19px 10px}#b_results li.b_ans.b_mop.b_mopb .b_sideBleed{margin-left:-19px;margin-right:-19px}.iacfm .iacf_head{display:flex;align-items:center;gap:var(--smtc-gap-between-content-small);text-decoration-color:var(--smtc-foreground-content-neutral-primary);box-sizing:border-box;margin-bottom:var(--smtc-gap-between-content-x-small)}.iacfm .iacf_head span{flex:1 1 0;white-space:nowrap;text-overflow:ellipsis;overflow:hidden;color:var(--smtc-foreground-content-neutral-primary);font:var(--bing-smtc-text-global-body3-strong)}.iacfm .iacf_head div{display:flex;height:22px;width:22px;justify-content:center;align-items:center;transition:background 300ms ease-out;margin-right:-3px;border-radius:var(--mai-smtc-corner-list-card-default);overflow:hidden}.iacfm .iacf_head .iacf_chv{color:var(--smtc-foreground-content-neutral-primary)}[dir="rtl"] .iacfm .iacf_head svg{transform:scaleX(-1)}.rel_ent_w{margin:4px 0 9px}.rel_ent_w .rel_ent_w:focus-visible{outline-offset:-6px}.rel_ent_w.rel_ent_crs{margin:6px 0 16px}.b_top

.rel_ent_w{margin-top:-4px}.b_top .rel_ent_w.rel_ent_crs{margin-top:0}.b_mm_swipable .rel_ent_w{margin:4px 0 20px}.b_rich .rel_ent_w{margin:-3px -16px 8px}.rel_ent_w.rel_ent_scr:not(.rel_ent_crs){height:50px;overflow:hidden}.rel_ent_c{white-space:nowrap;overflow:hidden;padding-left:1px;height:50px}.aqptmt:not(.rel_ent_crs) .rel_ent_c{display:flex}.rel_ent_wp .rel_ent_c{white-space:initial}.rel_ent_scr .rel_ent_c{overflow-y:hidden;-webkit-overflow-scrolling:touch;overflow-x:auto}.rel_ent_scr:not(.rel_ent_crs) .rel_ent_c{padding-bottom:12px}.b_mm_swipable .rel_ent_c{padding-left:10px;margin-top:-2px;margin-bottom:4px}.b_rich .rel_ent_c{padding-left:15px}.rel_ent_w.rel_ent_crs .slide,.rel_ent_w.rel_ent_crs .slide:hover{width:auto;height:42px;border-radius:20px!important;box-shadow:none!important;overflow:visible}a.rel_ent{display:inline-block;padding:0 16px 0 12px;margin:4px 8px 4px 0;border-radius:20px;border:1px solid #ddd;text-decoration:none;overflow:hidden;height:40px;max-width:80vw}:not(#lgVidAnsContainer)>.aqptmt .rel_ent_c a.rel_ent{overflow:initial;display:flex}.slide a.rel_ent{margin:0;box-shadow:none}.b_slidebar .slide .rel_ent .cico,.rel_ent .cico,.rel_ent>img{display:inline-block;vertical-align:middle;margin:2px 8px 2px -10px;border-radius:50%;background:#f7f7f7;flex-shrink:0}.rel_ent_tw{vertical-align:middle;font-size:12px;color:var(--smtc-foreground-content-neutral-primary);line-height:16px;height:100%;float:right;display:table}.rel_ent_t{display:table-cell;vertical-align:middle;align-content:center}.aqptmt:not(.splt2) .rel_ent_tw,.aqptmt:not(.splt2) .rel_ent_tw .rel_ent_t{overflow:hidden;text-overflow:ellipsis;white-space:nowrap}.aqptmt:not(.splt2) .rel_ent_tw{display:flex;overflow:hidden;text-overflow:ellipsis;align-items:center;white-space:nowrap}.rel_ent_w:not(.splt2) .rel_ent_t strong{display:inline-block;font-weight:normal}#b_results phead .b_attribution{padding-bottom:8px}.iaplanner .b_moreLink{margin-top:11px}.iaplanner.iarnd .b_moreLink{margin-top:3px}.b_ans .b_rich pserp.b_mBMargin{padding:0;border-top:0}.b_ans #vidans2 .b_rich .rel_ent_w{margin:6px 0 16px}.aqptmt a.rel_ent{border-color:#106ebe}.aqptmt:not(.splt2) .rel_ent_tw,.aqptmt:not(.splt2) .rel_ent_tw .rel_ent_t{font-size:16px}.b_overlay .btn.rounded{position:absolute;cursor:pointer;z-index:1;-moz-user-select:none;-khtml-user-select:none;-webkit-user-select:none;-o-user-select:none;-ms-user-select:none;user-select:none}.b_overlay .btn.rounded,.b_overlay .btn.rounded .bg,.b_overlay .btn.rounded .cr,.b_overlay .btn.rounded .cr>div,.b_overlay .btn.rounded .vcac>div{border-radius:50%}.b_overlay .btn.rounded .vcac{height:0}.b_overlay .btn.rounded{height:32px;width:32px;top:50%;margin-top:-16px}.b_overlay .btn.rounded .bg,.b_overlay .btn.rounded:hover .bg{opacity:0}.b_overlay .btn.rtl.rounded .cr{direction:ltr}.b_overlay .btn.hidden.rounded .cr,.b_overlay .btn.disabled.rounded .cr{visibility:hidden}.b_overlay .btn.rounded .cr>div{border:1px solid #ecec;box-shadow:0 2px 3px 0 rgba(0,0,0,.1);height:30px;width:30px;overflow:hidden;background-image:none;background-color:#fff}.b_overlay .btn.rounded .cr>div:hover{box-shadow:0 2px 4px 1px rgba(0,0,0,.14)}.b_overlay .btn.rounded .cr>div:after{bottom:5px;background-color:#fff;transform-origin:-430px 0;display:inline-block;transform:scale(.5);position:relative}.b_overlay .btn.rounded .cr>div:hover:after{transform-origin:-514px 0}.b_overlay .btn.ltr.rounded .cr>div:after{right:5px}.b_overlay .btn.rtl.rounded .cr>div:after{left:5px}.b_overlay .btn.prev.ltr.rounded .cr,.b_overlay .btn.next.rtl.rounded .cr{transform:scaleX(-1)}body .b_overlay .btn.rounded.next{right:-12px}body .b_overlay .btn.rounded.prev{left:-13px}.ra_car_container .b_overlay .btn.prev.ltr.rounded .cr>div,.ra_car_container

.b_overlay .btn.next.rtl.rounded .cr>div{transform:unset}.ra_car_container .b_overlay .btn.rounded .cr>div{background-position:0;border:unset}.ra_car_container .b_overlay .btn.rounded .cr>div:after{content:unset}@media screen and (forced-colors:active){.b_overlay .btn.rounded.hidden *,.b_overlay .btn.rounded.disabled *{background:none}.b_overlay .btn.rounded.hidden,.b_overlay .btn.rounded.disabled{background:none}}.b_overlay .btn.rounded .cr>div:after{content:url(/rp/EX_mgILPdYtFnI-37m1pZn5YKII.png)}#b_content .iacfic.mmkiaacf .iacfmit .imgInfo{color:var(--smtc-ctrl-link-foreground-brand-rest)}#b_content .iacfic.mmkiaacf .iacfmit a{text-decoration-color:var(--smtc-ctrl-link-foreground-brand-hover)}#b_content .iacfic.mmkiaacf .iacfmit .imgInfo{font:var(--bing-smtc-text-global-body3)}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel]>div[data-wptds-carousel-scroll-container]{padding-bottom:52px}#b_content .iacfic.mmkiaacf .iacfmit{box-sizing:initial;padding-bottom:52px}#b_content .iacfic.mmkiaacf .iacfmit .imgInfo{text-overflow:ellipsis;display:-webkit-box;-webkit-line-clamp:2;-webkit-box-orient:vertical;align-self:stretch;padding:0 var(--smtc-gap-between-content-xx-small);overflow:hidden}#b_content .iacfic.mmkiaacf .iacfimgc{padding-bottom:var(--smtc-gap-between-content-x-small)}#b_content .acfImgAns .salink,#b_content .acfImgAns .iasalink{text-align:center;display:block;padding-bottom:var(--smtc-gap-between-content-medium)}#b_content .acfImgAns .salink:hover .iasabt,#b_content .acfImgAns .iasalink:hover .iasabt{background:var(--smtc-background-ctrl-neutral-hover)}#b_content .acfImgAns .salink:active .iasabt,#b_content .acfImgAns .iasalink:active .iasabt{background:var(--smtc-background-ctrl-neutral-pressed)}#b_content .acfImgAns .iasabt,#b_content .acfImgAns .iaExp_chevron{height:initial;border-radius:var(--smtc-corner-circular);background:var(--bing-smtc-background-ctrl-neutral-rest);display:inline-block;position:relative;top:0;box-shadow:initial}#b_content .acfImgAns .iasatxt{font:var(--bing-smtc-text-global-caption1-strong);color:var(--bing-smtc-foreground-content-brand-rest);padding:var(--smtc-gap-between-content-x-small) var(--smtc-gap-between-content-small);display:flex;gap:var(--smtc-gap-between-content-x-small);justify-content:center;align-items:center}#b_content .acfImgAns .salink::before,#b_content .acfImgAns .iasalink::before{border-bottom:1px solid var(--smtc-stroke-ctrl-on-neutral-rest);width:100%;display:block;content:"";top:18px;position:relative}#b_content .acfImgAns .svg{vertical-align:top}#b_content .acfImgAns .svgpath{fill:var(--bing-smtc-foreground-content-brand-rest)}#b_content .acfImgAns .iachevron,#b_content .acfImgAns .svgicon{width:12px;height:12px;margin-left:0;position:relative;top:0}html[dir=rtl] #b_content .acfImgAns .iachevron,html[dir=rtl] #b_content .acfImgAns .svgicon{transform:scaleX(-1)}#b_content .acfImgAns .rel_ent_w a.rel_ent{border:1px solid var(--smtc-stroke-ctrl-on-neutral-rest)}#b_content .acfImgAns .iaheader .iacf_head{text-decoration-color:var(--smtc-foreground-ctrl-neutral-primary-hover)}#b_content .acfImgAns .iaheader .iacf_head span,#b_content .acfImgAns .iaheader .iacf_head svg{color:var(--smtc-foreground-content-neutral-primary);forced-color-adjust:auto}#b_content .iacfic.mmkiaacf .iacf_plan .cico{border-radius:var(--mai-smtc-corner-card-default)}#b_content .iacfic.mmkiaacf .iacf_plan .cico img{border-radius:var(--mai-smtc-corner-card-default)}#b_content .iacfic.mmkiaacf{overflow:visible;padding:0}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel]{margin:0;padding-bottom:var(--smtc-gap-between-content-medium)}#b_cont

ent .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] [data-wptds-carousel-controls]{--wptds-carousel-control-opacity:1}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel]>div{padding:0}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] [data-direction="end"]{margin-right:-22px}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] [data-direction="end"] svg{transform:scaleX(-1)}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] [data-direction="start"]{margin-left:-22px}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] [data-direction="start"] svg{transform:scaleX(1)}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] button{background:var(--smtc-background-card-on-primary-default-rest);box-shadow:var(--bing-smtc-shadows-card-hover-3);width:36px;border-radius:var(--smtc-corner-ctrl-lg-rest)}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] button:hover{background:var(--smtc-background-card-on-primary-default-hover)}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] button:active{background:var(--smtc-background-card-on-primary-default-pressed)}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] button svg{transition:initial}#b_content .iacfic.mmkiaacf .iacf_crsl[data-wptds-carousel] button svg path{fill:var(--smtc-foreground-content-neutral-secondary);forced-color-adjust:auto}#b_content .iacfic.mmkiaacf .iacfmit{position:absolute}#b_content .iacfic.mmkiaacf .iacfimgc{margin:auto}#b_content .b_ans.b_imgansacf{padding:0!important}#b_content .b_ans.b_top.b_imgansacf{background-color:initial!important}#b_content .acfImgAns .iaheader .iacf_head{gap:0;padding:var(--smtc-gap-between-content-medium) 0;display:flex;align-items:center;box-sizing:border-box}#b_content .acfImgAns .iaheader .iacf_head:hover{text-decoration:none}#b_content .acfImgAns .iaheader .iacf_head:hover span{text-decoration:underline}#b_content .acfImgAns .iaheader .iacf_head:hover .iacf_chv{background:initial}#b_content .acfImgAns .iaheader .iacf_head div{display:flex;align-items:center;transition:background 300ms ease-out;margin-right:-3px;border-radius:var(--smtc-corner-ctrl-rest);overflow:hidden;color:var(--bing-smtc-foreground-content-neutral-secondary-alt)}#b_content .acfImgAns .iaheader .iacf_head span{width:initial;flex:none;font:var(--bing-smtc-text-global-subtitle1-strong);padding-inline-start:0;max-width:90%;text-overflow:ellipsis;white-space:nowrap;overflow:hidden}#b_content .acfImgAns .iaheader .iacf_head .iacf_chv{width:22px;justify-content:center;height:22px}#b_content .acfImgAns .rel_ent_w{margin-top:0}#b_content .acfImgAns .rel_ent_w .b_slideexp{margin:0}#b_content .acfImgAns .rel_ent_w .btn.rounded{top:initial;margin-top:1px}#b_content .acfImgAns .rel_ent_w .btn.next{right:-14px}#b_content .acfImgAns .rel_ent_w .cr>div{width:36px;height:38px;border-radius:var(--smtc-corner-ctrl-lg-rest);background:var(--bing-smtc-background-container);box-shadow:var(--bing-smtc-shadows-card-hover-3);border:initial}#b_content .acfImgAns .rel_ent_w .cr>div:after{margin-inline-start:2px;top:0}#b_content .acfImgAns .rel_ent_w .b_viewport{padding-top:0;margin-left:0;padding-left:0}#b_content .acfImgAns .rel_ent_w .b_viewport .slide{height:38px;margin-left:0;margin-inline-end:var(--smtc-gap-between-content-x-small)}#b_content .acfImgAns .rel_ent_w a.rel_ent{border-radius:var(--smtc-corner-circular);background:var(--smtc-background-card-on-primary-default-rest);padding-left:0;height:38px}#b_content .acfImgAns .rel_ent_w a.rel_ent:hover{background:var(--smtc-background-ctrl-outline-hover)}#b_content .acfImgAns .rel_ent_w

a.rel_ent:active{background:var(--smtc-background-ctrl-outline-pressed)}#b_content .acfImgAns .rel_ent_w .cico{margin:var(--smtc-gap-between-content-xx-small) var(--smtc-gap-between-content-x-small) var(--smtc-gap-between-content-xx-small) var(--smtc-gap-between-content-xx-small)}#b_content .acfImgAns .rel_ent_w .rel_ent_tw{font:var(--bing-smtc-text-global-caption1-strong)}#b_content .acfImgAns .rel_ent_w .rel_ent_c{padding-left:0}#b_content .acfImgAns .rel_ent_w .b_slidebar{padding-inline-start:0}#b_content .acfImgAns .rel_ent_w .rel_ent_c .rel_ent:first-child{margin-inline-start:var(--mai-smtc-padding-card-default);align-items:center}html[dir=rtl] #b_content .acfImgAns .iaheader .iacf_head svg{transform:scaleX(-1)}html[dir=rtl] #b_content .acfImgAns .iacf_crsl[data-wptds-carousel] [data-direction="end"]{transform:scaleX(-1)}html[dir=rtl] #b_content .acfImgAns .iacf_crsl[data-wptds-carousel] [data-direction="start"]{transform:scaleX(-1)}[data-vs-icon-template]{display:none!important}.iacf_vsicon{position:absolute;top:12px;right:12px;width:28px;height:28px;background-color:var(--mai-smtc-background-ctrl-on-image-rest);border-radius:var(--smtc-corner-circular);display:none;align-items:center;justify-content:center;border:1px solid var(--smtc-stroke-ctrl-on-neutral-rest);cursor:pointer;opacity:0;z-index:1000;box-sizing:border-box;pointer-events:none}.iacf_vsicon acf-icon{color:var(--mai-smtc-foreground-ctrl-on-image-rest)}.iacf_vsicon.iacf_vsicon_show{display:flex;opacity:1}acf-icon{display:block;inline-size:fit-content;max-inline-size:100%;pointer-events:none}acf-icon,acf-icon::before,acf-icon::after,acf-icon *,acf-icon *::before,acf-icon *::after{box-sizing:border-box;margin:0;padding:0}acf-icon[hidden],acf-icon *[hidden]{display:none}acf-icon[data-visually-hidden],acf-icon *[data-visually-hidden]{block-size:1px;inline-size:1px;margin:unset;padding:unset;border:0;clip:rect(0 0 0 0);clip-path:inset(50%);overflow:clip;position:absolute;white-space:nowrap}.acf-icon__def{display:none}.acf-icon__icon{display:block;inline-size:auto;color:inherit}[dir="rtl"] .acf-icon__icon{transform:scaleX(-1)}@media(forced-colors:active){acf-icon{color:ButtonText!important}}acf-icon[data-size="M"] .acf-icon__icon{block-size:16px}.iacfca{padding:var(--mai-smtc-padding-card-default);box-sizing:border-box;overflow:hidden;border-radius:var(--mai-smtc-corner-card-default)}.iacfca .iacf_crsl .iacfmit{overflow:hidden;position:relative}.iacfca .iacf_crsl .iacfmit .cico{overflow:hidden;border-radius:var(--mai-smtc-corner-list-card-default)}.iacfca .iacf_crsl .iacfmit .cico img{border-radius:inherit;transition:transform 300ms ease-out}.iacfca .iacf_crsl .iacfmit:hover .cico img{transform:scale(1.1)}.iacfca .iacfmit a:focus,.iacfca .iacfmit a:focus img{outline:0}.iacfca .iacfmit a:focus .cico::after{border-radius:inherit;box-shadow:inset 0 0 0 3px var(--bing-smtc-background-card-on-primary-alt-rest);outline:2px solid var(--smtc-foreground-content-neutral-secondary);outline-offset:-2px}.iacfca [data-wptds-carousel][data-default][data-variant="Normal"]{margin:0 calc(-1*var(--mai-smtc-padding-card-default));height:auto}.iacfca [data-wptds-carousel][data-default][data-variant="Normal"] [data-wptds-carousel-scroll-container]{padding:0 var(--mai-smtc-padding-card-default)}.iacfca [data-wptds-carousel][data-default][data-variant="Normal"] [data-wptds-carousel-scroll-container] ol{width:fit-content;align-items:center}.iacfca [data-wptds-carousel][data-default] [data-wptds-carousel-control][data-direction="end"]{margin-right:24px}.iacfca

[data-wptds-carousel][data-default]
[data-wptds-carousel-control][data-direction="start"]{margin-left:24px}.iacfca
.iacf_pag{position:absolute;bottom:8px;left:50%;transform:translate(-50%,0)}.cards.large
.iacfca{height:200px}[dir="rtl"] .iacfca .iacf_pag{transform:translate(50%,0)}.iacfm.iacfca
.iacf_crsl[data-wptds-carousel]
[data-wptds-carousel-control]{background:var(--bing-smtc-background-ctrl-neutral-rest);border:0;height:56px
;width:16px;transition:width .3s,background
.3s;color:var(--smtc-foreground-ctrl-neutral-primary-hover)}.iacfm.iacfca .iacf_crsl[data-wptds-carousel]
[data-wptds-carousel-control] svg{transition:transform .3s}.iacfm.iacfca .iacf_crsl[data-wptds-carousel]
[data-wptds-carousel-control]:hover{width:24px;background:var(--smtc-background-ctrl-neutral-hover)}.iacf
m.iacfca .iacf_crsl[data-wptds-carousel] [data-wptds-carousel-control] path{fill:currentColor}.iacfm.iacfca
.iacf_crsl[data-wptds-carousel] ol [data-direction="start"]{border-radius:0 8px 8px
0;margin-left:16px}.iacfm.iacfca .iacf_crsl[data-wptds-carousel] ol [data-direction="start"]
svg{transform:scale(.7)}.iacfm.iacfca .iacf_crsl[data-wptds-carousel] ol [data-direction="start"]:hover
svg{transform:scale(1)}.iacfm.iacfca .iacf_crsl[data-wptds-carousel] ol
[data-direction="end"]{border-radius:8px 0 0 8px;margin-right:16px}.iacfm.iacfca
.iacf_crsl[data-wptds-carousel] ol [data-direction="end"] svg{transform:scale(-.7)}.iacfm.iacfca
.iacf_crsl[data-wptds-carousel] ol [data-direction="end"]:hover svg{transform:scale(-1)}.iacfm.iacfca.iacf_fb
.iacf_crsl[data-wptds-carousel] [data-wptds-carousel-control],.iacfm.iacfca.iacf_ss
.iacf_crsl[data-wptds-carousel]
[data-wptds-carousel-control]{background:var(--mai-smtc-background-ctrl-on-image-rest);color:var(--mai-sm
tc-foreground-ctrl-on-image-rest)}.iacfm.iacfca.iacf_fb .iacf_crsl[data-wptds-carousel]
[data-wptds-carousel-control] path,.iacfm.iacfca.iacf_ss .iacf_crsl[data-wptds-carousel]
[data-wptds-carousel-control] path{fill:currentColor}.iacfca .iacf_colg_crsl
[data-wptds-carousel-list]{width:fit-content}.iacfca .iacf_colg_crsl .iacfmit{position:absolute}.iacfca
.iacf_colg_crsl
.cico{border-radius:0}.iacfca:not(.iacfh):has(>.iacf_colg_crsl){height:100%;width:100%;padding:0;overflow:
hidden;border-radius:inherit}.iacfca:not(.iacfh):has(>.iacf_colg_crsl)
.iacfmit{border-radius:0}.iacfca:not(.iacfh):has(>.iacf_colg_crsl) [data-wptds-carousel][data-default]
[data-wptds-carousel-controls]{inline-size:calc(100% + var(--wptds-carousel-control-size) -
var(--mai-smtc-padding-card-default)*2);transform:translateX(calc(0rem +
var(--mai-smtc-padding-card-default) - (var(--wptds-carousel-control-size)/2)))
translateY(-50%)}[data-wptds-carousel][data-default],[data-wptds-carousel][data-default]::before,[data-wptds-
carousel][data-default]::after,[data-wptds-carousel][data-default] *,[data-wptds-carousel][data-default]
*::before,[data-wptds-carousel][data-default]
*::after{box-sizing:border-box;margin:0;padding:0}[data-wptds-carousel][data-default][hidden],[data-wptds-c
arousel][data-default]
[hidden]{display:none}[data-wptds-carousel][data-default][data-visually-hidden],[data-wptds-carousel][data-d
efault] [data-visually-hidden]{block-size:.0625rem;border:0;clip:rect(0 0 0
0);inline-size:.0625rem;margin:-.0625rem;overflow:hidden;padding:0;position:absolute}[data-wptds-carousel]
[data-default]{--wptds-carousel-control-bg-color:#fff;--wptds-carousel-control-border-color:#ddd;--wptds-car
ousel-control-box-shadow:0rem .125rem .1875rem

rgba(0,0,0,.1);--wptds-carousel-control-fg-color:#767676;--wptds-carousel-control-size:2rem;display:block;position:relative;block-size:100%}[data-wptds-carousel][data-default]
[data-wptds-carousel-scroll-container]{overflow-x:auto;overflow-y:clip;scroll-behavior:smooth;block-size:100%;-ms-overflow-style:none;scrollbar-width:none}[data-wptds-carousel][data-default]
[data-wptds-carousel-scroll-container]::-webkit-scrollbar{display:none}[data-wptds-carousel][data-default]
[data-wptds-carousel-scroll-container]:focus-visible{outline-color:Highlight;outline-color:-webkit-focus-ring-color;outline-offset:.0625rem;outline-style:auto;outline-width:.0625rem}[data-wptds-carousel][data-default]
[data-wptds-carousel-list]{display:flex;gap:.5rem;list-style:none;block-size:100%}[data-wptds-carousel][data-default] [data-wptds-carousel-list]>*{flex-grow:0;flex-shrink:0}[data-wptds-carousel][data-default]
[data-wptds-carousel-list]>:not([data-wptds-carousel-item]){display:none}[data-wptds-carousel][data-default]
[data-wptds-carousel-item]{block-size:100%}[data-wptds-carousel][data-default]
[data-wptds-carousel-item]>*{block-size:100%}[data-wptds-carousel][data-default]
[data-wptds-carousel-item]>img{display:block;inline-size:auto}[data-wptds-carousel][data-default]
[data-wptds-carousel-controls]{list-style:none;position:absolute;inline-size:calc(100% + var(--wptds-carousel-control-size));inset-block-start:50%;transform:translateX(calc(0rem - (var(--wptds-carousel-control-size)/2)))
translateY(-50%);display:flex;align-items:center;justify-content:space-between;pointer-events:none}[data-wptds-carousel][data-default]
[data-wptds-carousel-controls]>*{flex-grow:0;flex-shrink:0}[data-wptds-carousel][data-default]
[data-wptds-carousel-control]{cursor:pointer;inline-size:var(--wptds-carousel-control-size);aspect-ratio:1;display:grid;place-content:center;border-radius:50%;background-color:var(--wptds-carousel-control-bg-color);border:.0625rem solid
var(--wptds-carousel-control-border-color);box-shadow:var(--wptds-carousel-control-box-shadow);color:var(--wptds-carousel-control-fg-color);opacity:var(--wptds-carousel-control-opacity);pointer-events:all}[data-wptds-carousel][data-default]
[data-wptds-carousel-control]:active{--wptds-carousel-control-bg-color:#fff;--wptds-carousel-control-border-color:#ddd;--wptds-carousel-control-box-shadow:0rem .125rem .1875rem rgba(0,0,0,.1);--wptds-carousel-control-fg-color:#767676}[data-wptds-carousel][data-default]
[data-wptds-carousel-control]:focus-visible{outline-color:Highlight;outline-color:-webkit-focus-ring-color;outline-offset:.0625rem;outline-style:auto;outline-width:.0625rem}[data-wptds-carousel][data-default]
[data-wptds-carousel-control] *{pointer-events:none}[data-wptds-carousel][data-default]
[data-wptds-carousel-control]>svg{display:block}[data-wptds-carousel][data-default]
[data-wptds-carousel-control][data-direction="start"]>svg{transform:scaleX(1)}[data-wptds-carousel][data-default]
[data-wptds-carousel-control][data-direction="end"]>svg{transform:scaleX(-1)}[data-wptds-carousel][data-default]
[data-wptds-carousel-control][aria-disabled="true"]{visibility:hidden;cursor:not-allowed}[data-wptds-carousel][data-default] [data-wptds-carousel-announce]{block-size:.0625rem;border:0;clip:rect(0 0 0 0);inline-size:.0625rem;margin:-.0625rem;overflow:hidden;padding:0;position:absolute}[data-wptds-carousel]
[data-default][data-variant="Normal"],[data-wptds-carousel][data-default][data-variant="FullWidth"]{--wptds-carousel-control-opacity:0}[data-wptds-carousel][data-default][data-variant="Normal"]:has([data-wptds-carousel-scroll-container]:focus-visible),[data-wptds-carousel][data-default][data-variant="Normal"]:has([data-wpt

ds-carousel-control]:focus-visible),[data-wptds-carousel][data-default][data-variant="FullWidth"]:has([data-wptds-carousel-scroll-container]:focus-visible),[data-wptds-carousel][data-default][data-variant="FullWidth"]:has([data-wptds-carousel-control]:focus-visible){--wptds-carousel-control-opacity:1}[data-wptds-carousel][data-default][data-variant="Normal"][data-snap] [data-wptds-carousel-scroll-container]{scroll-snap-type:x proximity}[data-wptds-carousel][data-default][data-variant="Normal"][data-snap] [data-wptds-carousel-item]{scroll-snap-align:center;scroll-snap-stop:always}[data-wptds-carousel][data-default][data-variant="Normal"][data-snap] [data-wptds-carousel-item]:first-of-type{scroll-snap-align:start}[data-wptds-carousel][data-default][data-variant="Normal"][data-snap] [data-wptds-carousel-item]:last-of-type{scroll-snap-align:end}[data-wptds-carousel][data-default][data-variant="FullWidth"] [data-wptds-carousel-scroll-container]{scroll-snap-type:x mandatory}[data-wptds-carousel][data-default][data-variant="FullWidth"] [data-wptds-carousel-item]{inline-size:100%;scroll-snap-align:center;scroll-snap-stop:always}[data-wptds-carousel][data-default][data-variant="FullWidth"] [data-wptds-carousel-item]:first-of-type{scroll-snap-align:start}[data-wptds-carousel][data-default][data-variant="FullWidth"] [data-wptds-carousel-item]:last-of-type{scroll-snap-align:end}[data-wptds-carousel][data-default][data-variant="FullWidth"] [data-wptds-carousel-item]>*{inline-size:100%}[data-wptds-carousel][data-default][data-bleed-inline] [data-wptds-carousel-controls]{--control-side-gap:.25rem;inline-size:calc(100% -(var(--control-side-gap)*2));transform:translateX(calc(0rem + var(--control-side-gap))) translateY(-50%)}[data-wptds-carousel][data-desktop] [data-wptds-carousel-control]:hover:not([aria-disabled="true"]):not(:active){--wptds-carousel-control-bg-color:#fff;--wptds-carousel-control-border-color:#ddd;--wptds-carousel-control-box-shadow:0rem .125rem .3125rem rgba(0,0,0,.14);--wptds-carousel-control-fg-color:#111}[data-wptds-carousel][data-desktop][data-variant="Normal"]:has([data-wptds-carousel-scroll-container]:hover),[data-wptds-carousel][data-desktop][data-variant="Normal"]:has([data-wptds-carousel-control]:hover),[data-wptds-carousel][data-desktop][data-variant="FullWidth"]:has([data-wptds-carousel-scroll-container]:hover),[data-wptds-carousel][data-desktop][data-variant="FullWidth"]:has([data-wptds-carousel-control]:hover){--wptds-carousel-control-opacity:1}[dir="rtl"] [data-wptds-carousel][data-default] [data-wptds-carousel-controls]{transform:translateX(calc(0rem + (var(--wptds-carousel-control-size)/2))) translateY(-50%)}[dir="rtl"] [data-wptds-carousel][data-default] [data-wptds-carousel-control][data-direction="start"]>svg{transform:scaleX(-1)}[dir="rtl"] [data-wptds-carousel][data-default] [data-wptds-carousel-control][data-direction="end"]>svg{transform:scaleX(1)}[dir="rtl"] [data-wptds-carousel][data-default][data-bleed-inline] [data-wptds-carousel-controls]{transform:translateX(calc(0rem - var(--control-side-gap))) translateY(-50%)}.b_dark [data-wptds-carousel][data-default],.b_drk [data-wptds-carousel][data-default]{--wptds-carousel-control-bg-color:#484644;--wptds-carousel-control-border-color:#545250;--wptds-carousel-control-box-shadow:0rem .125rem .1875rem rgba(0,0,0,.1);--wptds-carousel-control-fg-color:#d2d0ce}.b_dark [data-wptds-carousel][data-default] [data-wptds-carousel-control]:active,.b_drk [data-wptds-carousel][data-default]

[data-wptds-carousel-control]:active{--wptds-carousel-control-bg-color:#484644;--wptds-carousel-control-border-color:#545250;--wptds-carousel-control-box-shadow:0rem .125rem .1875rem rgba(0,0,0,.1);--wptds-carousel-control-fg-color:#d2d0ce}.b_dark [data-wptds-carousel][data-desktop] [data-wptds-carousel-control]:hover:not([aria-disabled="true"]):not(:active),.b_drk [data-wptds-carousel][data-desktop] [data-wptds-carousel-control]:hover:not([aria-disabled="true"]):not(:active){--wptds-carousel-control-bg-color:#605e5c;--wptds-carousel-control-border-color:#545250;--wptds-carousel-control-box-shadow:0rem .125rem .3125rem rgba(0,0,0,.14);--wptds-carousel-control-fg-color:#faf9f8}.gs_card .iacfic .iacfmit .iacfimgc,.gs_card .iacfic .iacfmit .cico,.b_wpt_container .iacfic .iacfmit .iacfimgc,.b_wpt_container .iacfic .iacfmit .cico{width:100%!important;height:100%!important;border-radius:0}.gs_card .iacfic .iacfmit.iacfstc img,.gs_card .iacfic .iacfmit .iacfimgc img,.b_wpt_container .iacfic .iacfmit.iacfstc img,.b_wpt_container .iacfic .iacfmit .iacfimgc img{width:100%;height:100%;object-fit:cover}#slideexp3_95C921 .slide { margin-right: 8px; }#slideexp3_95C921c .b_slidebar .slide { border-radius: 6px; }#slideexp3_95C921 .slide:last-child { margin-right: 1px; }#slideexp3_95C921c { margin: -4px; } #slideexp3_95C921c .b_viewport { padding: 4px 1px 4px 1px; margin: 0 3px; } #slideexp3_95C921c .b_slidebar .slide { box-shadow: 0 0 0 1px rgba(0, 0, 0, 0.05); -webkit-box-shadow: 0 0 0 1px rgba(0, 0, 0, 0.05); } #slideexp3_95C921c .b_slidebar .slide.see_more { box-shadow: 0 0 0 0px rgba(0, 0, 0, 0.00); -webkit-box-shadow: 0 0 0 0px rgba(0, 0, 0, 0.00); } #slideexp3_95C921c .b_slidebar .slide.see_more .carousel_seemore { border: 0px; }#slideexp3_95C921c .b_slidebar .slide.see_more:hover { box-shadow: 0 0 0 0px rgba(0, 0, 0, 0.00); -webkit-box-shadow: 0 0 0 0px rgba(0, 0, 0, 0.00); }Images of Eff Photovoltaic panelsRecyclingSolar PanelsBenefitsFlexible Solar PanelsInstallationMonocrystalline Solar PanelsDesignPolycrystalline Solar PanelsEfficiencySolar Pv Efficiency | Solar Cell Efficiency Table - WEOSMost efficient solar panels 2023 -- Clean Energy ReviewsPhotovoltaic Efficiency A New Angle On Photovoltaic Solar PanelSolar Panel Energy Efficiency and Degradation Over Time - Energy TheoryTop 4 Most Efficient Solar Panels (2026 Reviews)How to improve solar panel efficiency - Tycorun Battery Energy Storage ...The rise of high-efficiency solar panels: Maxeon"s breakthrough - greenMeSolar Panel Efficiency: What You Need To KnowSolar Panel Efficiency - The Complete Guide (UK) | SolyUnderstanding Solar Panel EfficiencySee allp>.news_dt{color:#767676}WikipediaSolar-cell efficiency - WikipediaAs of 2024, the world record for solar cell efficiency is 47.6%, set in May 2022 by Fraunhofer ISE, with a III-V four-junction concentrating photovoltaic (CPV) cell. [7][8] This beat the previous record of ...

You may hear the term solar panel efficiency thrown around. We explain what it means and list the most efficient solar panels on the market today.

Here"s what solar panel efficiency means, why it"s important, and how it should inform your solar panel system purchase.

We"ll tell you which panels get top marks for turning sunlight into the most energy, and we"ll explain how much solar panel efficiency actually matters when it ...

Discover the most efficient solar panels of 2025. Our expert guide helps you choose top-performing, cost-effective panels ...

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