# HEIC Image Format: A Comprehensive Report

## Technical Specifications of HEIC

**Format and Structure:** HEIC stands for High Efficiency Image Container, and it is essentially the container file format for images under the HEIF standard (High Efficiency Image File Format) developed by MPEG[[1]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=HEIC%2C%20which%20stands%20for%20High,developed%20by%20the%20MPEG%20group). HEIC is built on the ISO Base Media File Format structure (the same foundation as MP4 video files), meaning image data and metadata are organized in a series of boxes/atoms within the file[[2]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=is%20a%20special%20case%20of,of%20this%20resource%20have%20learned)[[3]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=The%20ISO_BMFF%20mechanism%20for%20distinguishing,encoding%20because%20it%20is%20the). Each HEIC file begins with a file type box (ftyp) identifying it as an HEIF/HEIC file via a *brand* code (for example, heic or heix)[[3]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=The%20ISO_BMFF%20mechanism%20for%20distinguishing,encoding%20because%20it%20is%20the). The **.heic extension** is commonly used for HEVC-compressed HEIF images (single images), while **.heics** may denote image sequence files (multiple images)[[4]](https://www.adobe.com/creativecloud/file-types/image/raster/heic-file.html#:~:text=technology.%20This%20space,image%20file%20formats%2C%20like%20JPEGs). Apple devices use the .heic extension for photos and pronounce it "heek"[[5]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=format%20description%20is%20primarily%20for,is%20selected%20as%20the).

**Compression Codec:** HEIC uses the High Efficiency Video Coding (**HEVC**, also known as H.265) codec for image compression by default[[6]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=HEIF%20can%20store%20images%20encoded,3). In practice, a HEIC image is like a single *intra-coded* video frame encoded with HEVC’s advanced compression algorithms. This modern codec allows HEIC to store images in **half the file size of an equivalent quality JPEG**[[7]](https://www.adobe.com/creativecloud/file-types/image/raster/heic-file.html#:~:text=Apple%20uses%20HEIC%20for%20HEIF,image%20file%20formats%2C%20like%20JPEGs). HEVC-based still-image encoding (sometimes called the HEVC Main Still Picture profile) offers much more efficient compression than the older JPEG’s DCT-based compression[[8]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=Secondly%2C%20it%20supports%20many%20types,at%20all%20in%20web%20workflows). HEIC also supports **lossless compression** modes – the HEIF specification allows images to be saved without quality loss, though most HEIC photos (such as those from phones) are saved with lossy compression for maximum size savings[[9]](https://cloudinary.com/guides/image-formats/heif-vs-heic#:~:text=Understanding%20the%20difference%20between%20lossless,results%20in%20some%20quality%20loss). In addition to HEVC, the HEIF container can theoretically hold images encoded with other codecs (e.g. H.264 AVC or even JPEG encoding), but HEVC is the standard in the context of HEIC files[[10]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=particular%20file%20types,devices%20as%20of%20November%202020).

**Color Depth and Quality:** HEIC supports **deep color and high dynamic range** imaging. While JPEG is limited to 8-bit per channel (256 levels per color, ~16.7 million colors total), HEIC images can be **10-bit, 12-bit, or even 16-bit** per color channel[[11]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Superior%20Image%20Quality)[[12]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=heic%20should%20only%20be%20used,example%20files%2C%20see%20Notes%20below). In practical use, many HEIC photos are 10-bit, which allows over a billion possible colors and enables true HDR photos with extended dynamic range and smoother gradients[[13]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=2.%2010)[[14]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,does%20not%20support%20at%20all). For example, recent smartphones and high-end cameras use 10-bit HEIF/HEIC to capture more vibrant HDR images with wide color gamuts (such as Rec.2020 or P3 color primaries)[[15]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=%2A%20The%20Canon%20EOS,bit)[[16]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,bit%20camera%20output.%5B%2048). HEIC also supports various chroma subsampling modes beyond the 4:2:0 of JPEG – the .heic brand is typically limited to 8-bit 4:2:0 (sufficient for most photos), while the .heix brand indicates high bit depth (≥10-bit) or less chroma subsampling (4:2:2 or 4:4:4) for even higher fidelity[[17]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=Sony%20brought%20out%20cameras%20which,example%20files%2C%20see%20Notes%20below).

**Metadata and Auxiliary Data:** The HEIC/HEIF format is designed to carry rich metadata and additional media streams. HEIC files **preserve standard EXIF metadata** (camera settings, GPS location, etc.) just like JPEG does[[18]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=4,Information)[[19]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=HEIC%20is%20able%20to%20preserve,depth%20maps%2C%20and%20scene%20information). In addition, the format can store **XMP data and IPTC tags** for extensive image descriptions (when supported by software). Uniquely, HEIC can also include **auxiliary image data** such as **depth maps or alpha transparency planes** to complement the main image[[20]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Image%20sequences%20Storage%20of%20multiple,not%20displayed%20as%20such%2C%20but). For instance, portrait photos on dual-camera phones may save a depth map alongside the image, enabling realistic background blur adjustments later. HEIC's container structure even allows **non-destructive editing instructions** to be stored: instead of saving a separate edited copy, a HEIC file can record operations like rotations, crops, or overlays as instructions within the file[[21]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Image%20items%20Storage%20of%20individual,of%20derived%20images%20is%20small). This means an app could undo or adjust edits because the original image and the edit recipe are both preserved in the file. Overall, HEIC files efficiently bundle an image with its metadata and any related media. Apple’s usage of HEIC takes advantage of this by storing Live Photos (which include a video clip) and dual-camera depth information in the container[[18]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=4,Information)[[19]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=HEIC%20is%20able%20to%20preserve,depth%20maps%2C%20and%20scene%20information).

**Multiple Images and Animation:** Unlike JPEG or PNG, which store only one image per file, HEIC is capable of holding **multiple images in one file**. It can act as a container for **image sequences** or photo bursts, making it possible to store a series of shots (for example, all frames of a burst or an entire animation) together[[22]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=features%20such%20as%3A)[[23]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,for%20animations%20and%20image%20sequences). These can be encoded efficiently by exploiting similarities between frames, a technique borrowed from video compression, to drastically reduce total size when many related images are stored together[[20]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Image%20sequences%20Storage%20of%20multiple,not%20displayed%20as%20such%2C%20but). This feature is the basis for Apple’s “Live Photos,” where a HEIC file may contain several image frames (and optionally audio) to create a short animation while still behaving like a single photo file. More generally, HEIC can serve as a lightweight alternative to GIF or video for short animations, since it supports both **image sequences and even audio tracks** within the container[[24]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Metadata%20and%20Rich%20Media). Additionally, **alpha channel (transparency) support** is built into the format: an auxiliary image item can serve as a full alpha mask, meaning HEIC can store images with transparent backgrounds (similar to PNG’s functionality)[[25]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=features%20such%20as%3A)[[26]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=5,Alpha%20Channels). This combination of capabilities – multiple frames, audio, and transparency – makes HEIC a very **versatile image container** for modern photography and graphics needs.

## Compression Methods and Efficiency

HEIC achieves its high compression efficiency primarily through the power of the **HEVC (H.265) compression algorithm**. HEVC was designed for high-resolution video (4K and beyond), and it brings those advanced techniques to still image coding in HEIC. Key factors in how HEIC **maintains quality while reducing file size** include:

* **Advanced Intra-Frame Compression:** HEVC uses more flexible and complex intra-frame compression than JPEG’s 1990s-era algorithm. Instead of fixed 8×8 blocks with DCT (discrete cosine transform) as in JPEG, HEVC can use variable block sizes up to 64×64 pixels and many more intra-prediction modes to find the most efficient way to represent an image region[[8]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=Secondly%2C%20it%20supports%20many%20types,at%20all%20in%20web%20workflows). It can predict flat areas or gradients in an image from neighboring blocks with great accuracy, which means less information needs to be stored for those areas. These techniques result in fewer compression artifacts – HEIC images at equivalent filesize show **far less blocking or ringing** artifacts compared to heavily compressed JPEGs[[27]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=AVIF%3F%20www,that%20plague%20aggressive%20JPEG%20policies).
* **Efficient Entropy Coding:** HEVC employs modern entropy coding (like CABAC – Context-Adaptive Binary Arithmetic Coding) which packs bits more efficiently than the older Huffman coding used in JPEG. This further squeezes the image data without losing detail, contributing to the significant **bitrate reduction**. Studies have shown HEVC-based still image encoding can deliver the *same* visual quality with about **25–50% less bitrate** than JPEG, depending on the image and quality metrics used[[28]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=the%20irreversible%20floating%20point%209,in%20a%20paper%20titled)[[29]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=performance%20of%20HEVC%20Main%20Still,compression%20was%20found%20to%20be). In practical terms, photos in HEIC format are often **around half the size of an equivalent quality JPEG** – a 5 MB photo might compress to ~2.5 MB in HEIC with no noticeable quality difference[[7]](https://www.adobe.com/creativecloud/file-types/image/raster/heic-file.html#:~:text=Apple%20uses%20HEIC%20for%20HEIF,image%20file%20formats%2C%20like%20JPEGs)[[30]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=%2A%20Up%20to%2050,bandwidth%20for%20uploads%20and%20backups).
* **High Precision and Less Data Loss:** Because HEIC supports higher bit depth and more sophisticated color compression, it retains fine details and color gradients better than JPEG. For example, an HEIC photo can preserve subtle variations in skies or shadows without banding, even at high compression, thanks to 10-bit color and HEVC’s precision. HEVC’s tools also reduce color bleed and can handle low-light noise more gracefully than JPEG’s older compression, which tends to blotch or blur details under heavy compression.
* **Multiple Image Compression:** When multiple images are stored in one HEIC container (such as burst shots or an image sequence), the format can employ **inter-frame compression** similar to a video codec. Redundant information between frames can be stored once and reused, drastically cutting down total size for sequences[[20]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Image%20sequences%20Storage%20of%20multiple,not%20displayed%20as%20such%2C%20but). For instance, a 1-second burst of 10 photos might be only marginally larger than a single photo if the frames are similar, because HEVC can encode the differences between frames very efficiently. This makes HEIC ideal for features like Live Photos or HDR bracketing, where several images are captured at once[[31]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=Firstly%2C%20the%20file%20container%20supports,view%20images)[[32]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=images%20with%20multi,view%20images).
* **Optional Lossless Mode:** While HEIC is usually used as a lossy format, HEIF also supports a lossless compression mode[[9]](https://cloudinary.com/guides/image-formats/heif-vs-heic#:~:text=Understanding%20the%20difference%20between%20lossless,results%20in%20some%20quality%20loss). In lossless mode, the image is compressed such that it can be decoded to an exact pixel-for-pixel copy of the original. HEVC’s range of coding tools includes a lossless configuration (for example, by disabling quantization). This gives HEIC the **flexibility** to serve in scenarios where fidelity is critical (archival images, medical imaging, etc.), although with a smaller compression benefit. In practice, most HEIC photos (like those from iPhones) use lossy compression for maximum space savings, not lossless.

All these methods mean that HEIC can **retain higher image quality at a fraction of the file size** compared to older formats. Users typically observe that HEIC images maintain clarity and detail even at aggressive compression settings, where an equivalent JPEG would show noticeable degradation. One source notes that HEIC achieves roughly a **50% file size reduction with no visible quality loss** – effectively doubling storage capacity for photos[[33]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=Should%20I%20serve%20HEIC%20derivatives%3F)[[30]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=%2A%20Up%20to%2050,bandwidth%20for%20uploads%20and%20backups). The trade-off to this efficiency is increased computational complexity: encoding or decoding HEIC/HEVC requires more processing power and time than JPEG. On modern devices this isn’t a problem, but on low-end hardware or older devices, opening or editing a HEIC can be slower due to the heavy compression algorithms involved[[34]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Higher%20Processing%20Requirements). In summary, HEIC’s compression approach leverages cutting-edge video compression technology to deliver much **smaller images** that **look as good or better** than traditional JPEGs of larger size.

## Comparison with JPEG, PNG, and WebP

HEIC is one of the “next-generation” image formats, and it differs from older formats like JPEG and PNG, as well as fellow modern format WebP, in several ways. The following table provides a high-level comparison of **HEIC vs. JPEG vs. PNG vs. WebP** in terms of compression, quality, and features:

| **Feature** | **JPEG** (JPG) | **PNG** | **WebP** | **HEIC** (HEIF/HEVC) |
| --- | --- | --- | --- | --- |
| **Compression Type** | Lossy only (DCT-based). Optimized for photos in 1990s. | Lossless only (deflate compression for pixel data). Best for graphics, not photos. | Both lossy and lossless. Lossy uses VP8 intra-frame (from video); lossless mode also available. | Both lossy and lossless. Lossy uses HEVC intra-frame coding; also supports lossless mode.[[9]](https://cloudinary.com/guides/image-formats/heif-vs-heic#:~:text=Understanding%20the%20difference%20between%20lossless,results%20in%20some%20quality%20loss) |
| **Typical File Size** | Baseline standard; larger files for equivalent quality.<br>*(Reference: JPEG is the baseline for size comparison)* | Very large for photo content (lossless compression means no quality loss but huge files for high-res images). | ~25–35% smaller than JPEG for similar quality (significantly better compression than JPEG)[[35]](https://medium.com/@adi.mizrahi/the-best-image-format-for-mobile-applications-5fa9c9bdc2f4#:~:text=According%20to%20this%20study%2C%20we,significant%20compression%20improvements%20over%20JPEG). | ~50% smaller than JPEG for same quality (highly efficient compression)[[7]](https://www.adobe.com/creativecloud/file-types/image/raster/heic-file.html#:~:text=Apple%20uses%20HEIC%20for%20HEIF,image%20file%20formats%2C%20like%20JPEGs)[[30]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=%2A%20Up%20to%2050,bandwidth%20for%20uploads%20and%20backups). |
| **Image Quality** | Good at moderate compression, but visible artifacts (blocking, ringing) at high compression. 8-bit color limit can cause banding in gradients. | Perfect image quality (lossless), no compression artifacts. Supports high bit depth (up to 16-bit), so can store HDR data, but file size is extremely large if used that way. | Very good quality at given size; better than JPEG at equal file size, though at extreme compression may introduce slight blurriness instead of blockiness[[36]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=Google%20claims%20that%20this%20format,cases%2C%20balanced%20by%20increasing%20blurriness). Generally 8-bit color; no HDR support[[37]](https://afosto.com/blog/avif-vs-webp-format/#:~:text=AVIF%20vs%20WebP%20,does%20not%20support%20images). | Excellent quality retention; minimal artifacts even at strong compression (preserves detail better than JPEG). Supports deep color (10-bit+), enabling HDR images with wide color gamut[[14]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,does%20not%20support%20at%20all). Practically free of JPEG’s blocky artifacts at the same size[[27]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=AVIF%3F%20www,that%20plague%20aggressive%20JPEG%20policies). |
| **Color Depth** | 8-bit per channel (24-bit color). No HDR; limited to ~16.7 million colors. | Up to 16-bit per channel (48-bit color) in PNG format, which can represent ~281 trillion colors (useful for scientific/high dynamic range images). | 8-bit per channel (24-bit color) for VP8-based WebP[[37]](https://afosto.com/blog/avif-vs-webp-format/#:~:text=AVIF%20vs%20WebP%20,does%20not%20support%20images). *(WebP does not support 10-bit or HDR in the standard format.)* | Supports 8, 10, 12, or 16-bit per channel[[11]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Superior%20Image%20Quality). Commonly 10-bit in many implementations (over 1 billion colors), enabling true HDR and smoother gradients. |
| **Transparency (Alpha)** | **No** – JPEG has no alpha channel support. | **Yes** – Supports full alpha channel (transparency) in RGBA images. | **Yes** – Supports 8-bit alpha transparency (even in lossy mode)[[38]](https://developers.google.com/speed/webp/faq#:~:text=Developers%20developers,bit%20alpha). | **Yes** – Supports alpha via auxiliary image plane (can store transparent images)[[25]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=features%20such%20as%3A)[[26]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=5,Alpha%20Channels). |
| **Animation** | **No** – Single image only (JPEG cannot animate unless used in hacks or video). | **No** *– Standard PNG is single-image. (*APNG\* extension allows simple animations, but not universally used.) | **Yes** – WebP supports animated images (multiple frames) in a single file, effectively a modern GIF replacement. | **Yes** – HEIC/HEIF supports image sequences and animation. Multiple images (and even audio) can be stored in one file[[23]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,for%20animations%20and%20image%20sequences)[[39]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=HEIC%20can%20store%20multiple%20images,sequences%20within%20a%20single%20container). Useful for Live Photos, bursts, or GIF-like animations. |
| **Metadata Support** | EXIF, IPTC, XMP metadata supported (JPEG can embed camera data, geotags, etc.). | Can embed text chunks and some metadata (e.g. PNG can hold textual info, color profiles, but EXIF is not standardized in PNG). | Supports EXIF and XMP metadata in containers. Also supports color profiles. | Fully supports EXIF, XMP, etc. Additionally can store **advanced metadata** like camera depth maps, image orientation for rotation, editing instructions, thumbnails, and more[[24]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Metadata%20and%20Rich%20Media)[[40]](https://cloudinary.com/guides/image-formats/heif-vs-heic#:~:text=Another%20big%20benefit%20is%20the,context%20for%20image%20processing%20algorithms). |
| **Multi-Image in One File** | **No** – one image per file. | **No** – one image per file (APNG for animation is an extension). | **Yes** – for animation WebP can contain multiple frames, but not typically used for storing photo bursts. | **Yes** – designed for multiple images. Can contain photo bursts, image grids, different exposures, etc., in one file[[25]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=features%20such%20as%3A). Also can include related media (audio for live photo). |

**Comparison Highlights:** In summary, **HEIC offers superior compression and more features** than the older JPEG and PNG formats, albeit with less universal support. Compared to **JPEG**, HEIC produces **much smaller files for the same quality** – often *around 50% size savings*[[7]](https://www.adobe.com/creativecloud/file-types/image/raster/heic-file.html#:~:text=Apple%20uses%20HEIC%20for%20HEIF,image%20file%20formats%2C%20like%20JPEGs). This is a major advantage in storage and bandwidth. HEIC also supports transparency and advanced features that JPEG cannot (JPEG has no alpha channel or multi-frame capability)[[25]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=features%20such%20as%3A). Additionally, HEIC’s support for 10-bit color means it can store **HDR images** with far more color detail than JPEG’s 8-bit limitation[[14]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,does%20not%20support%20at%20all). The main area where JPEG still wins is **compatibility** – virtually every device, OS, and browser can open JPEG, while HEIC is newer and not yet universally supported[[41]](https://medium.com/@adi.mizrahi/the-best-image-format-for-mobile-applications-5fa9c9bdc2f4#:~:text=Compatibility%20While%20,an%20iPhone%20to%20a%20PC). Also, JPEG encoding/decoding is less CPU-intensive, making it faster on older hardware.

Compared to **PNG**, HEIC serves a different primary purpose. PNG is a lossless format ideal for graphics, text, and images requiring exact reproduction (and of course for **transparency** needs). However, PNG produces **huge file sizes** for photographic images due to its lossless nature[[42]](https://cloudinary.com/guides/image-formats/heif-vs-heic#:~:text=Conversely%2C%20PNG%20is%20often%20used,due%20to%20their%20superior%20compression). HEIC can achieve similar or better image quality for photos at a tiny fraction of the size by using lossy compression. Notably, both HEIC and PNG support transparency – HEIC can thus be used in cases where one might use a transparent PNG (for example, overlays or cut-outs) but with the benefit of much smaller files if some loss can be tolerated[[26]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=5,Alpha%20Channels)[[43]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Supports%20Transparency). For **true lossless** image storage, PNG still has the edge in simplicity and compatibility. But for most practical purposes (where a slight compression loss is acceptable), HEIC’s **versatility (alpha + high compression)** makes it a compelling replacement for PNG in imaging workflows, provided the software supports it. One thing PNG cannot do (natively) is animation or multi-image storage – HEIC covers those use cases, potentially replacing the need for formats like GIF or APNG when supported[[44]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=6,Burst%20Mode).

Compared to **WebP**, the competition is closer. WebP is another modern format introduced by Google, and it also offers both lossy and lossless compression, transparency, and animation support. WebP’s lossy compression (based on the VP8 codec) is **more efficient than JPEG** – typically yielding 25–30% smaller files than JPEG for equivalent quality[[35]](https://medium.com/@adi.mizrahi/the-best-image-format-for-mobile-applications-5fa9c9bdc2f4#:~:text=According%20to%20this%20study%2C%20we,significant%20compression%20improvements%20over%20JPEG). However, **HEIC (HEVC) is even more efficient**, especially at higher quality levels or for high-resolution images, often saving about 50% versus JPEG[[7]](https://www.adobe.com/creativecloud/file-types/image/raster/heic-file.html#:~:text=Apple%20uses%20HEIC%20for%20HEIF,image%20file%20formats%2C%20like%20JPEGs). When comparing HEIC and WebP directly, HEIC tends to have an edge in compression *and* supports higher bit depth (WebP is limited to 8-bit color, so it cannot encode HDR imagery)[[37]](https://afosto.com/blog/avif-vs-webp-format/#:~:text=AVIF%20vs%20WebP%20,does%20not%20support%20images). On the other hand, **WebP has become far more widely supported** in recent years: all major web browsers (Chrome, Firefox, Safari (since 2020), Edge, etc.) and many apps can display WebP images, making it practical for web use. HEIC, due to patent/licensing issues with HEVC, has **slower adoption outside Apple’s ecosystem**[[45]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=coding%20times%20%E2%80%94%20not%20a,at%20all%20in%20web%20workflows)[[46]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=Like%20H265%2C%20HEIC%20based%20on,for%20HEIC%20in%20the%20web). For instance, Safari (on iOS/macOS) is currently the only browser that can natively display HEIC images as of 2024[[47]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=). In workflows where broad compatibility is needed (e.g. web publishing), WebP is generally a safer choice today. But for purely mobile or Apple-centric applications, or scenarios needing the highest compression and quality (or HDR support), **HEIC can provide better results**. Both WebP and HEIC support animation; HEIC might achieve smaller sizes for a given animation due to more advanced inter-frame coding, but WebP is already widely used for animated stickers, etc. In short, WebP and HEIC are both powerful; **HEIC pushes the envelope further technically**, while WebP enjoys better current support.

*(It’s worth noting there are even newer formats like* *AVIF* *(based on AV1) and* *JPEG XL, which aim to surpass both HEIC and WebP. However, those are beyond our scope. In practice, HEIC and WebP are two of the prominent modern formats competing to replace JPEG/PNG.)*

## Device and Software Support for HEIC

Despite its technical advantages, HEIC’s adoption has been uneven. Support varies across different operating systems, devices, and applications. Below is an overview of **where HEIC is supported natively, where it requires add-ons, and where it’s not supported**:

* **Apple Ecosystem:** Apple was the first major adopter of HEIC. **iOS 11 and later** (since the iPhone 7 in 2017) save photos in HEIC format by default[[48]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Apple%20was%20the%20first%20major,7)[[49]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=Apple%20Ecosystem%20). All modern iPhones and iPads (iOS/iPadOS) have native support: you can view, edit, and share HEIC photos seamlessly in the Photos app or any app using the system image picker. **macOS High Sierra (10.13) and later** on Macs likewise have built-in support[[50]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,maintain%20this%20format%20between%20devices)[[51]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=compression%20and%20modern%20imaging.%20,maintain%20this%20format%20between%20devices). Mac applications like Preview, Photos, and Finder can open and thumbnail HEIC images natively. AirDrop between Apple devices preserves HEIC files, and iCloud Photos stores them without conversion[[50][52]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,maintain%20this%20format%20between%20devices). Essentially, within Apple’s ecosystem, **support is complete and transparent** – users may not even realize a photo is HEIC instead of JPEG.
* **Windows:** Microsoft added HEIC support starting with **Windows 10** (version 1803, released 2018), but it’s not enabled out-of-the-box by default. Windows uses a system of extensions: users must install the **HEIF Image Extensions** (free) from Microsoft, and *for HEVC decoding* Windows 10 also requires the **HEVC Video Extensions** (a small paid add-on in the Store)[[53]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,in%20by%20default.%5B%2038)[[54]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=and%20write%20files%20that%20use,in). With these installed, Windows 10 and 11 can open .heic files in the Photos app, generate thumbnails in File Explorer, and let applications use the codecs to decode/encode images[[55]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=Windows%20)[[56]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,Explorer%2C%20and%20certain%20edit%20software). As of **Windows 11 (22H2)**, the HEIF extension is built-in by default (though the HEVC codec may still need to be installed for a fee)[[57]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=free.,heifs%20for%20image). Once set up, users can view HEIC images in Photos or even Paint and then save them as other formats if needed. Without these extensions, Windows will not recognize .heic files. In summary, Windows has **partial native support** – it’s available but requires an extra step. This has been a pain point for some users, as casual users may not know why the images won’t open, and the requirement to pay for the HEVC codec has been criticized[[58]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=2)[[59]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=On%20Windows%2010%2F11%2C%20launching%20HEIC,file%20generally%20entails).
* **Android:** Android’s support for HEIC/HEIF has improved over time. Basic HEIF support (for decoding images) was added in **Android 8.0 Oreo**. Full support for capturing HEIC photos arrived in **Android 10** (2019) on devices with the proper hardware encoders[[60]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Android%20devices%20containing%20the%20appropriate,8)[[61]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=sequence%20files,51). In practice, many Android devices running Android 9 Pie or above can at least view HEIC images, and popular models (Samsung Galaxy, Google Pixel, etc.) on Android 10+ can also shoot photos in HEIC through the default camera or a setting[[62]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=Android%20Devices%20)[[63]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,app%20support%20can%20be%20different). For example, Samsung and Google allow HEIC as a shooting option on recent phones to save storage. However, support is not uniform: some manufacturers or camera apps stick to JPEG for compatibility. By **Android 12**, support extended to the new AVIF format as well, but HEIC remained available too[[61]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=sequence%20files,51). As of Android 13, the platform even supports 10-bit image capture in HEIC for HDR photos on capable hardware[[64]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,51). Overall, on **modern Android devices** one can expect at least partial HEIC capability, but it may depend on the OEM’s software. It’s recommended to check if a specific phone’s camera app offers “High Efficiency” image format in settings. Viewing HEICs in gallery apps is generally fine on new Androids, whereas older Androids might require a third-party app to decode them.
* **Linux and Other Unix:** There is no native HEIC support in most Linux distributions by default, but the open-source community provides libraries to handle HEIF. For instance, **libheif** is a popular library that enables HEIC decoding/encoding on Linux[[65]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=%2A%20libheif%20%E2%80%93%20ISO%2FIEC%2023008,HEIF%20library%20with%20Java%20wrapper). Many Linux image viewers (like Eye of Gnome, gThumb, or KDE Gwenview) and editors (GIMP, ImageMagick, etc.) have added support if libheif is installed[[66]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,58)[[67]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,60). Modern Linux distros (Ubuntu 20.04+, Debian 10+, Fedora 36+, etc.) include HEIF support in their repositories or even by default[[68]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=higher%20support%2010,51). So while Linux might not open a .heic out-of-the-box on a fresh install, installing the relevant codec is usually straightforward. Open-source software has broadly adopted HEIC in recent years – for example, GIMP has been able to read/export HEIC since 2018[[66]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,58), and ImageMagick and ffmpeg support it as well[[69]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=%2A%20Digikam%20%20%28supports%2010,60)[[65]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=%2A%20libheif%20%E2%80%93%20ISO%2FIEC%2023008,HEIF%20library%20with%20Java%20wrapper).
* **Web Browsers:** At present, **web browser support for HEIC is very limited**. As of mid-2024, **Apple Safari** (on macOS and iOS) is the only major browser that can display HEIC images natively[[47]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=). This is largely because Safari can leverage the operating system’s image codecs (and on Apple OS, HEIC is supported). Other browsers like Chrome, Firefox, and Edge do *not* support using HEIC files in <img> tags or CSS by default. One reason is the patent-encumbered nature of HEVC – browsers have been hesitant to implement HEVC decoding due to licensing costs. Instead, web browsers have focused on AVIF (which is royalty-free) as the next-gen image, and indeed Chrome, Firefox, Opera all support AVIF images now[[70]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=As%20of%20August%C2%A02024,52). Web developers typically do not serve HEIC images directly; they will convert HEIC uploads to JPEG, WebP, or AVIF for compatibility. If a user tries to open a .heic file directly in Chrome or Firefox, it won’t display (unless on an iPhone, where the system might hand it off to OS viewer). **Bottom line:** HEIC is *not suitable for direct use on websites* yet[[71]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Not%20Ideal%20for%20the%20Web). Any HEIC images on the web must be converted on-the-fly (for example, some CDN or server can detect support and deliver JPEG/WebP as fallback). Even services like Dropbox or Google Photos, which **store** your HEIC files, will convert them to a web-friendly format when you view or share them in a browser for compatibility[[72][73]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,share%20them%20for%20improved%20compatibility).
* **Image Editing and Viewing Software:** Support in software has grown, but with caveats. Many popular **photo editors and viewers now handle HEIC**:
* *Adobe* – Photoshop and Lightroom added HEIC support (Photoshop requires the Windows codecs on Windows)[[74]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,2). As of 2022, Photoshop can read HEIC images but **only in 8-bit mode** (it will not preserve 10-bit color in HEIC and it cannot yet save/export as HEIC)[[75]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Although%20HEIC%20is%20gaining%20in,bit%20HEIC.%5B%2011)[[76]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,bit%20HEIC). Lightroom can import HEIC on all platforms where the OS supports it[[74]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,2).
* *Other Editors* – Affinity Photo, Corel PaintShop Pro, Pixelmator, Zoner, and many other commercial editors added HEIC support in recent versions[[66]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,58)[[77]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,only%29%20%2A%20XnView%5B%2063). Often the limitation is they might internally treat it as 8-bit.
* *Free/Open-Source* – GIMP (since v2.10.2) can open and save HEIC images[[66]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,58). ImageMagick can convert HEIC if built with libheif support[[69]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=%2A%20Digikam%20%20%28supports%2010,60). Paint.NET (Windows) supports HEIC with a plugin or when Windows codecs are installed[[67]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,60). XnView and IrfanView (popular image viewers) also support reading .heic files (sometimes needing plugins)[[77]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,only%29%20%2A%20XnView%5B%2063).
* *Default Viewers* – On macOS, Preview opens HEIC. On Windows, the Photos app will open HEIC once the extension is in place. On Android, Google Photos app and most gallery apps will show HEIC if the system supports it. On iOS, Photos app obviously works natively.

In summary, **new versions of most image software can handle HEIC**, but older versions might not. One notable gap: some software only handles the baseline 8-bit HEIC and not higher bit depths. For example, as of late 2023, Photoshop will flatten a 10-bit HEIC to 8-bit on open[[78]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Although%20HEIC%20is%20gaining%20in,bit%20HEIC.%5B%2011). Professionals using HEIC from high-end cameras must ensure their tools support the color depth and HDR info or else those advantages could be lost in editing.

* **Cameras and Devices:** HEIC isn’t just for smartphones. Many **digital cameras** have started offering HEIF/HEIC image capture because of its advantages. For instance, Canon’s EOS-1D X Mark III and EOS R5/R6 can shoot HEIF images in 10-bit HDR format (using the PQ or HLG HDR standards)[[15]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=%2A%20The%20Canon%20EOS,bit)[[79]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=). Nikon’s flagship Z9/Z8 and Sony’s Alpha 1/α7 IV also support 10-bit HEIF for stills[[80]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=%2A%20The%20Canon%20EOS,200%20Fujifilm)[[81]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,75). Typically these cameras use the “heix” brand (often with a .HIF extension) for files, indicating the higher bit depth. The benefit is that photographers can get an image with JPEG-like convenience (small file, ready to use) but with **HDR and high bit depth** for better tone mapping on HDR displays[[15]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=%2A%20The%20Canon%20EOS,bit)[[16]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,bit%20camera%20output.%5B%2048). These cameras often let the user choose between JPEG or HEIF for 8-bit vs 10-bit output. On the smartphone side, **all recent iPhones** shoot HEIC by default, and several Android models (Samsung, Xiaomi, Oppo, etc.) have settings for HEIC images as well[[82]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,79)[[83]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,bit%20camera%20output.%5B%2048). However, many social media apps or third-party camera apps might still capture JPEG unless updated. The general trend is that hardware support for HEIC is **increasing**, especially as the industry moves toward HDR imaging. Yet, due to the compatibility concerns, devices often give the user an option to fall back to JPEG if needed (for example, iPhone Settings > Camera > Formats > “Most Compatible” switches to JPEG).

In summary, **Apple devices fully embrace HEIC**, Windows and Android have added support but require some awareness (installing codecs or using recent OS versions), and most other platforms/software are catching up with at least read support. The primary holdouts are web browsers and certain legacy systems. Because of these gaps, HEIC users sometimes need to convert images when sharing outside of a supported environment – as discussed next.

## Conversion and Usage in Workflows

Given the patchy support, converting HEIC images to more common formats is a frequent task. Here are **tools and methods for converting and using HEIC files** in typical workflows:

* **Within Apple Ecosystem:** If you stay within Apple devices, you usually **don’t need to convert** – macOS and iOS handle HEIC transparently. However, when sharing or exporting out, Apple provides automatic conversion options. For example, when you **AirDrop** a photo to an older Mac or send via iMessage to an Android, the system may convert the HEIC to JPEG on-the-fly for compatibility. The iOS Photos app will also convert to JPEG if you use the “Save to Files” or mail the photo (depending on settings). In iPhone settings, there is a “Most Compatible” option which, if enabled, will make the camera save new photos as JPEG instead of HEIC to avoid compatibility issues[[48]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=Apple%20was%20the%20first%20major,7)[[84]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=On%20some%20systems%2C%20pictures%20stored,10). This is useful if you know you’ll need to work with the images on non-Apple systems that can’t handle HEIC. On macOS, you can easily convert HEIC images using **Preview**: just open the .heic in Preview and go to **File > Export**, then choose JPEG or PNG and save[[85]](https://superuser.com/questions/1811863/easiest-way-to-convert-heic-to-jpeg-or-png#:~:text=Easiest%20way%20to%20convert%20HEIC,%C2%B7%20Give%20your). Apple’s Photos app on Mac can also export selected photos as JPEG, PNG, or TIFF via the Export function. These built-in tools make it straightforward to convert when needed.
* **Windows Conversion:** On Windows 10/11, once you have the HEIF and HEVC extensions installed (as described above), you can open HEIC images in the **Photos app or even MS Paint**. A simple method to convert one image is to open it in Paint and then use **File > Save As** to save a copy as JPEG or PNG. This uses the system’s codec to do the conversion. For bulk conversions, a quick option is the Windows **Photos** app’s export: select multiple images and use the “Save a copy” or “Export” function if available (though Windows Photos might not have a multi-export, a third-party app might be better for bulk). There are also free utilities in the Microsoft Store specifically for HEIC conversion. Microsoft’s PowerToys even offers an image resizer that can output in different formats (though as of 2025, it may still rely on installed codecs for HEIC). If you prefer command-line or automation, **ImageMagick** (with the proper codecs) can batch convert: e.g. magick \*.heic \*.jpg will convert all HEICs to JPEGs in a directory. Similarly, **ffmpeg** or **libheif’s heif-convert** tool can be used in scripts. Numerous third-party programs (XnConvert, iMazing HEIC Converter, CopyTrans HEIC, etc.) exist for both Windows and Mac to batch convert HEIC to JPEG with drag-and-drop ease.
* **Using Adobe or Other Software:** If you have Adobe Photoshop, you can open HEIC files (ensure the Windows codecs are installed if on Windows). Once opened, you can simply **Save As** or export to your desired format (Photoshop will typically default to saving as JPEG or PNG since it cannot save .heic itself yet[[76]](https://en.wikipedia.org/wiki/High_Efficiency_Image_File_Format#:~:text=,bit%20HEIC)). Adobe Lightroom Classic can import HEIC images and you can then export them as JPEG, DNG, etc. with your edits. In many workflows, photographers shoot in HEIC to save space, then use Lightroom/Photoshop to edit and output the final images as JPEGs for clients or web use. *Note:* When converting from HEIC to JPEG, if the HEIC was 10-bit HDR, the resulting JPEG (being 8-bit SDR) will **lose some dynamic range and color information**. The conversion will tone-map or discard the extended color data, so the output might not look exactly as punchy as the original on an HDR display. Essentially, you’re falling back to standard range. This is usually fine for most uses (since JPEG can’t display HDR anyway), but it’s something to keep in mind for critical applications.
* **On Mobile:** If you need to convert on a mobile device (to attach in an email or upload somewhere that rejects HEIC), often the simplest way is to use the system share options. On iPhone, for example, if you attach a photo to an email via the Mail app, iOS will convert it to JPEG automatically (unless you specifically choose “Actual Size” in some cases). There are also many free converter apps in the App Store that can take HEIC images from your camera roll and save copies as JPEG or PNG. On Android, if you have photos in HEIC format, Google Photos will convert them to JPEG if you try to download them or share via certain apps that require JPEG. Some camera apps also allow switching format.
* **Online Converters:** Numerous free online tools can convert HEIC to JPEG/PNG; for example, browser-based services where you upload .heic files and get back JPEGs. These are handy if you just have a few images and are on a device that doesn’t support HEIC. However, be mindful of privacy and quality (uploading personal photos to unknown sites may not be ideal). The conversion itself is not complicated – typically, the quality of the JPEG output can be chosen. A high-quality JPEG (quality 90+%) from a HEIC will still be larger than the HEIC, but should retain virtually all visible detail the HEIC had (except minor compression differences).
* **Integrating into Workflows:** If you are a professional or enthusiast dealing with HEIC in your workflow, it’s good to adopt a strategy. For example:
* If shooting photos on an iPhone in HEIC but editing on a Windows PC, you might set the iPhone to auto-transfer as JPEG when connecting via USB (there’s a setting in iOS that when you copy photos to PC via the Photos app or Explorer, it can automatically convert to JPEG for you). This saves the manual conversion step.
* If archiving or sharing with others, consider converting to a universally readable format unless you’re sure the recipients can handle HEIC. Many people convert their HEICs to JPEG before posting on websites or sending to print services, just to avoid issues.
* Some workflows use **scripts or batch processes**: for instance, a photographer might use a Lightroom preset or an Automator script on Mac to convert all HEICs to JPEG on import for consistency with their library.

One must also consider that **conversion can sometimes entail minor quality loss or loss of certain data**. Converting from HEIC (which is lossy) to JPEG (another lossy format) will recompress the image, potentially introducing a little extra quality loss (usually negligible if high quality is chosen). To avoid compounding losses, one could convert HEIC to a lossless format like PNG or TIFF; however, those files will be much larger and metadata like EXIF should be preserved in TIFF but might be lost in PNG. Also, features like depth maps or live photo video tracks in HEIC **will not carry over** in a conversion to JPEG/PNG – they would simply be discarded, since JPEG/PNG can only hold the main image[[86]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=5,Loss%20of%20Quality). Any **special metadata** (e.g. edit lists, portrait effects) may be lost on conversion as well[[86]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=5,Loss%20of%20Quality). Essentially, the image conversion gives you the visible photo but strips out any extras.

Despite these considerations, converting HEIC is now a routine and well-supported task. Many users have integrated HEIC into their workflows: they enjoy the space savings on their devices, and when needed, they convert images to share or use in less compatible contexts. As support for HEIC grows, the need for conversion will diminish. But until then, having these tools and methods at hand ensures that HEIC files can be **edited, shared, and utilized** in any scenario – from professional editing suites to social media – with just a bit of extra effort.

## Conclusion

HEIC is a **technically advanced image format** that brings high efficiency and new capabilities to photography. It offers superior compression (smaller file sizes) while retaining excellent quality, support for deep color and HDR, the ability to hold multiple images or even video in one file, and features like transparency and rich metadata that go beyond what JPEG and PNG can do[[14]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,does%20not%20support%20at%20all)[[26]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=5,Alpha%20Channels). These advantages make HEIC a forward-looking format well-suited for the demands of modern cameras and mobile devices, where storage space, image quality, and new imaging tricks (like Live Photos and portrait depth effects) all matter.

However, as a **new format**, HEIC comes with challenges. **Compatibility** is the biggest hurdle – not all software and platforms can handle HEIC natively, especially outside of the Apple ecosystem[[87]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Limited%20Compatibility)[[71]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Not%20Ideal%20for%20the%20Web). This has led to a period where users and professionals often need to convert HEIC files to more ubiquitous formats like JPEG for broader sharing and use. There are also **computational costs** to its efficiency: working with HEIC (encoding/decoding) requires more processing power, which can tax older devices[[34]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Higher%20Processing%20Requirements). And for developers or platform providers, HEIC’s reliance on a patented codec (HEVC) introduces licensing considerations[[88]](https://help.picsart.io/hc/en-us/articles/27399210909085-What-Are-the-Pros-and-Cons-of-Using-HEIC#:~:text=Licensing%20and%20Legal%20Complexity).

In comparing HEIC to other formats, we see a clear **trade-off**: HEIC and similar next-gen formats are pushing the boundaries in size and quality, but older formats like JPEG and PNG still win on universality and simplicity. **WebP** has emerged as a strong competitor, covering some of the same ground with broader support but not the full technical prowess of HEIC (notably lacking HDR support). For now, many workflows adopt a hybrid approach: using HEIC where its advantages shine (e.g. personal device storage, closed ecosystems, professional cameras capturing HDR images) and then converting to JPEG/PNG/WebP when distributing content widely.

Looking forward, as operating systems and software continue to integrate HEIC support – and with even newer formats like AVIF gaining traction – we can expect the image format landscape to evolve. HEIC has established itself firmly, thanks in large part to Apple’s adoption and the format’s genuine benefits. It may not completely replace JPEG in the immediate future, but it has carved out an important role in imaging. For anyone interested in photography or digital images, understanding HEIC is valuable: it is **representative of the modern shift** toward more efficient, feature-rich image encoding. Adopting HEIC can mean **storage savings, higher quality images, and new creative possibilities**, as long as one is mindful of the compatibility constraints and ready to use conversion tools when necessary[[89]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=HEIC%20is%20growing%20in%20reach%2C,conversion%20tools%20or%20additional%20software)[[14]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,does%20not%20support%20at%20all).

**Sources:** The information in this report was gathered from a range of up-to-date sources, including technical specifications and guides on HEIF/HEIC[[17]](https://www.loc.gov/preservation/digital/formats/fdd/fdd000526.shtml#:~:text=Sony%20brought%20out%20cameras%20which,example%20files%2C%20see%20Notes%20below)[[40]](https://cloudinary.com/guides/image-formats/heif-vs-heic#:~:text=Another%20big%20benefit%20is%20the,context%20for%20image%20processing%20algorithms), industry analyses and blog posts[[8]](https://www.freecodecamp.org/news/best-image-format-for-web-in-2019-jpeg-webp-heic-avif-41ba0c1b2789/#:~:text=Secondly%2C%20it%20supports%20many%20types,at%20all%20in%20web%20workflows)[[14]](https://www.outrightcrm.com/blog/what-is-heic-format/#:~:text=,does%20not%20support%20at%20all), as well as documentation from Apple and Adobe regarding usage and support[[7]](https://www.adobe.com/creativecloud/file-types/image/raster/heic-file.html#:~:text=Apple%20uses%20HEIC%20for%20HEIF,image%20file%20formats%2C%20like%20JPEGs)[[90]](https://www.adobe.com/creativecloud/file-types/image/raster/heic-file.html#:~:text=To%20open%20an%20HEIC%20file,in%20the%20default%20Photos%20app). These sources are cited throughout the text to provide detailed evidence and further reading on specific points. The goal was to provide a comprehensive yet accessible overview of the HEIC format, bridging the technical details with practical implications for everyday use.

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