



LED Lighting | Forged in America™

LED Grow Light Support Info: <https://independencedled.com/led-grow-lights/>

Cannabis Case Study and White Paper:

<https://independencedled.com/pdfs/Independence-LED-Grow-Light-Solutions-for-Cannabis-with-Case-Study-and-White-Paper-2018.07.18.pdf>

Cannabis Comparison Analysis - HPS vs. LEDs:

<https://independencedled.com/pdfs/Comparison-Analysis-Cannabis-for-Grow-Lights-HPS-and-LED-by-Independence-LED-Lighting-2018.07.24-updated-calculations.xlsx>

Cannabis Grow Operation - Air Conditioning Savings Analysis with LED Grow Lights

Sample Fixture: Independence LED Lighting: 18" x 48" 8 module lamps for flowering at a total of 432 watts with 4'x4' coverage area

Sample Grow Operation Size: 1,500 sq ft grow room

Fixtures Needed: 94 fixtures

AC sizing Calculations:

Average 3.4 BTUs per hour per watt

$3.4 \times 432w = 1,468$ BTUs per hour/ fixture

$\times 94$ fixtures = 137,992 BTUs / hour

$\times 12$ hours of light per day = 1,655,904 BTUs per day

1 ton of AC for every 12,000 BTUs of hourly (max) BTUs.

137,992 rounded up to 140,000 BTUs / 12,000 BTUs = 11.6 ton AC system.

The cost of Commercial AC systems ranges dramatically, but the average is between \$1,000 and \$1,500 per ton. Using \$1,250 x 11.6 tons, this AC system would cost about \$14,500. Given that a 1,000 watt equivalent HPS light fixture uses twice the electricity as LEDs, the AC equipment savings is about \$14,500.

The monthly and annual cost of electricity savings on the AC is a function of what you pay per kilowatt-hour for electricity.

Each ton of AC (12,000 BTUs) requires about 12,000 watts.

12 hours per day of light and electricity x 365 days / year = 4,380 annual hours.

LED Lighting:

$432\text{w} / \text{fixture} \times 94 \text{ fixtures} = 40,608\text{w}$

$40,608\text{w} \times 4,380 \text{ annual hours} / 1,000 = 175,426 \text{ annual kWh}$

At a delivered utility rate of \$.10 / kWh $\times 175,426\text{kWh} = \$17,542$ annual electricity cost for lighting.

With 1,500 sq ft, the annual lighting cost / sq ft is \$11.69

Air Conditioning:

$12,000\text{w} / \text{ton} \times 11.6 \text{ tons} = 139,200\text{w}$

$139,200\text{w} \times 4,380 \text{ annual hours} / 1,000 = 601,344 \text{ annual kWh}$

At a delivered utility rate of \$.10 / kWh $\times 601,344\text{Wh} = \$60,134$ annual electricity cost for lighting.

With 1,500 sq ft, the annual AC cost / sq ft is \$40.08

SAVINGS with LEDs

1,000w HPS use twice the electricity as the LEDs, so the operating cost for the lighting and air conditioning is doubled.

Annual lighting savings: \$17,542

Annual AC savings: \$60,134

Total annual electricity savings: \$77,676

- Initial savings on AC equipment: \$14,500
- Total Year One savings: \$92,176

LED equipment cost: $40,608\text{w} \times \$2/\text{watt MSRP} = \$81,216$

The savings justifies the LED investment over the first year to replace HPS. The savings is even higher if you factor the offset cost of HPS for facilities that are considering which lights to buy, and the installation labor is a sunk cost given that some lights would have to be installed regardless of the type.