Sustainability and Resiliency Committee Meeting

June 11, 2024 – 3:00pm
City Commission Chambers

Agenda

1. **Roll Call** (5 min.)

2. **Approval of Agenda** (5 min.)

3. **Approval of Minutes from April 9, 2024, Meeting** (5 min.)

4. **SRC Bus Wrap Update – Student Art Reveal**
   (15 min.) (Abhijna Kavasseri)

5. **2024 Cleanup Week Report**
   (20 min.) (Scott Olson and Jennifer Pickett – Solid Waste Department)

6. **LED Lighting Effects Presentation**
   (20 min.) (Kristina Klinkhammer)

7. **Public Comment** (10 min.)
   2.5 minutes per speaker

8. **Next Meeting** (5 min.)
   - August 13, 2024 (tentative)

Sustainability and Resiliency Committee
Fargo City Commission Chambers
April 9, 2024
3:00 p.m.

Present
John Strand (chair), Fargo City Commissioner
Bruce Grubb, Fargo City Administration
Mark Williams, Planning and Development
Brenda Derrig, Assistant City Administrator
Ben Dow, Director of Public Works
Becki Majerus, Director of Facilities Management
Shawn Ouradnik, City of Fargo Inspections Director
Luke Grittner, Transit Planner
Abhijna Kavasseri, Youth Initiative Representative
Mike Williams, At-Large Member of the Public
Zoe Absey, At-Large Member of the Public
James Hand, Fargo School District Representative (Ex-officio) (via conference call)

Absent
Tim Mahoney, Fargo Mayor
Jennifer Sweatman, At-Large Member of the Public
Casey Steele, At-Large Member of the Public
Greta Gramig, At-Large Member of the Public
Shawn Paschke, Xcel Energy Representative (Ex-officio)
Chad Braousseau, Cass County Electric Cooperative Representative (Ex-officio)
Dave Bietz, Fargo Park District Representative (Ex-officio)

Mr. Strand called the meeting to order.

Approve Agenda:

Mr. Strand pointed out that the agendas have been modified somewhat to include timelines built in and time limits when there is public comment so the meetings do not run long. Mr. Grubb moved, second by Ms. Derrig that the agenda be approved. There was unanimous approval.

Approve Minutes:

Ms. Derrig moved, second by Mr. Ouradnik that the minutes from the February 13, 2024 meeting be approved. There was unanimous approval.

SRC Bus Wrap Update

Mr. Grubb said Ms. Kavasseri has been working with Planning Department staff and finalists for the bus wrap design contest were selected.

Ms. Kavasseri said in January Communications and Planning staff assisted in getting the word out about the contest which helped with the number of submissions that were received. There were 20 total, she said, and members of the Arts and Culture Commission and Youth Initiative members reviewed the applications and chose the top three. She said now the final selections will go to the City Commission for approval at the April 15th meeting. The contest was well received, she said, and she enjoyed seeing the creativity in the range of ages of the artists.

Mr. Grittner said once the finalist is selected it likely would be less than a month before the wrap application. Contact has been made with a wrap vendor, he said, so the process will move quickly.

Mr. Strand said the top three winners will receive a stipend and the winning artwork will be featured on a bus. He suggested having the wrapped bus at City Hall at a future time for a photo opportunity when the Committee can see it.

Ms. Majerus said the plan is for the artwork to be on display on the first floor at City Hall on April 15th.

DOE Energy Efficiency and Conservation Block Grant (EECBG) – Building Energy Efficiency

Mr. Grubb said in early 2023, City Administrator Michael Redlinger was notified by the North Dakota League of Cities about a grant opportunity through the Department of Energy's EECBG program. It was a non-competitive direct formula grant the City would receive of $176,940.00; however, he said, the first thing was to file a pre-application due April 1, 2023, which was done. He said the follow-up was a formal project application to actually receive the money. Energy efficiency and buildings seemed to be a great theme to take on first, he said, and Ms. Majerus provided input. He introduced Mattie Anders and Hannah Delker from WSB who presented the formal application and the strategy plan virtually.

Ms. Anders, WSB Sustainability Program Manager, gave a background summary on WSB and their work with the City. WSB works on diverse projects and policies, she said, one locally is American Crystal Sugar. She said two areas WSB has worked with the City over the past several months are CPRG Implementation funding and ECBG funding. She said the City is applying for a Program Formula Grant awarded through the DOE called an Energy Efficiency and Conservation Block Grant (EECBG) which is noncompetitive and is $176,940.00 with a deadline of April 30, 2024. She said $430 million dollars is being dispersed to local governments for projects that cut carbon emissions, improve energy efficiency and reduce energy use, and up to about $17,940.00 of the $176,940.00 can be used for administrative expenses. The City is pursuing the voucher option, which covers technical assistance and is a simplified application process and faster turnaround time, she said. The Energy Efficiency and Conservation Strategy Plan (EECS) has to be developed along with the EECBG, she said, which includes a description of Fargo's goals for increasing energy efficiency and conservation in the future. She said staff has been looking at eligible activities under the program and identified a list of qualifying projects, should the City pursue roof replacement at the Public Health building for $315,000.00, about $176,000.00 of that would be covered and the City pay the rest, she said, so there will be more conversations on what to pursue. She said they are looking into whether the funding could be used for a computer aided facility management software. She said the EECBG is in the works and it will take coordination over the next few weeks to get all the pieces in order.

Ms. Majerus said her list consists of items that were requested in the 2024 budget; however, were not funded. She said computer-aided facility software would be a global attempt to track energy efficiency and to help identify where the most impact could be made.

Mr. Strand said a portion of earlier efforts and an underlying theme is to look for opportunities to bring actions home and find funding, which is where WSB is helping to deliver.

Mike Williams said over the years there have been proposals for performance-based sustainability funding, so money saved can be used to invest in projects that normally do not hit the budget. A consultant does not need to be hired to do that, he said, and the City could make that decision.

Mr. Grubb said the next item for discussion is a version of that concept where the savings get applied. The Department of Environmental Quality notified the City about the

availability of grant funding through the EPA's Climate Pollution Reduction Grant Program, he said. The Department of Environmental Quality (DEQ) had begun preparing a Statewide Priority Climate Action Plan (PCAP), he said, and it is a requirement to be eligible to receive grant money through the program. Public input sessions were held across the State, he said, and while the City was not successful with that, a white paper was noticed on the City website and the LED lighting program was zeroed in on. He said that was included as one of the State's top five priorities, which is important because for a project to be eligible, it has to be listed in one of the PCAPs. On March 1st it was discovered the City was listed, he said, and in less than a month the application was done ahead of the deadline. This is a nationwide competitive grant, he said, and the amount of the application is $2.64 million.

EPA Climate Control Pollution Reduction Grant (CPRG – Streetlights Conversion to LED)

Hannah Delker, WSB Graduate Municipal Engineer, said she appreciated the collaboration that made it possible to submit the application three days ahead of the deadline for the Climate Pollution Reduction Grant (CPRG). She outlined qualifications for the grant, stating that it does need to be part of a PCAP. She said other requirements are that it reduce greenhouse gas emissions, significant benefits to low-income and disadvantaged communities (LIDAC) and that it be an innovative or creative solution. The project proposed has the LED streetlights as the foundation and a broader mission of community outreach, she said, and replaces about 4,000 streetlights that do not have LED bulbs. LED bulbs are more efficient, reduce energy consumption and are better as far as longevity and function, she stated. The proposed project involves two years of construction, she said, and a half year was tacked on for anything that must happen at the end. She said the plan focuses on community relationships and connections and opening up conversations for future action, and community outreach that supports the streetlight projects. She shared an organization chart and said the project is overseen by the finance manager to be sure grant reporting is done properly, with Jeremy Gorden primarily as the cross-departmental liaison. She said for about a year and a half, there would be a part-time data management employee and for 2.5 years there would be a Communications manager with extra money included for a consultant to support that individual and an electrical contractor would support the work. The request was $2.64 million and encompasses everything needed to support this work, she said. A commitment made was to operate as if the budget included this, she said, and then the funds could be used for other work.

Mr. Grubb said neither grant requires a local match, making it a unique opportunity.

In response to a question from Mr. Strand asking if this project aligns with the Dark Sky Program, Transportation Division Engineer Jeremy Gorden said this project is more to replace what exists with a different type of bulb. He said the Dark Sky Program encourages that light shines down or has a cap on top of the light.

In response to a question from Ms. Absey asking when the hiring would begin, Ms. Delker said she believes funding is dispersed around October, pending revisions that may be requested, so if funding is awarded, hiring could happen as soon as November with the work beginning next summer. Community outreach could happen in winter and spring, she said, and plans could be developed and construction could start in the spring.

Mr. Gorden shared a PowerPoint highlighting the different light types on local, collector and arterial streets and items considered during design. He showed pictures of various LED types and variety of fixtures, explaining the differences and maintenance requirements. He said there are more than 15,000 lights in town, 8,300 of them are LED lights and the remaining are 100, 150, 250 and 400 watt High Pressure Sodium (HPS) lights and they are all over the City. He shared a map showing the lights to be replaced with LED and a map of the approximately 40% that are already replaced. He said changing from HPS

to LED saves about 60% to 65%. The grant proposes to change nearly 4,000 lights, he said, and there is also a project underway to replace 1,000 of the arterial and collector fixtures at a cost of $1M funded with Carbon Reduction Program funds from the Federal Highway Bill.

In response to a question from Ms. Absey asking how decisions have been made on where the lights have been changed, Mr. Gorden said for the most part, changes have been made as the bulbs burn out.

In response to a question from Mr. Strand asking if the amount residents are charged on their monthly bills for street lighting could be reduced as a result of increased efficiencies, Mr. Williams said if the City is saving money for conservation it would be great to cut the residents in on it too.

In response to a question from Mr. Strand asking if LED lights can be too bright, Mr. Gorden said there is a variance in color and warmth, so definitely color preferences. Color is graded in Kelvin, lower numbers such as 2,700 Kelvin are easier on the eyes and the whiter colors range from 3,000 to 6,000 Kelvin with the new LEDs used are 4,000. He said the color or warmth has nothing to do with energy. He said on a monthly basis, operating each HPS light costs from $25.00-$50.00, which is the same as an entire traffic signal operating at an intersection.

In response to a question from Mr. Strand asking about whether the philosophy of the City remains the same as far as well-lit neighborhoods, Mr. Gorden said about 10 years ago there were square blocks without street lights and the City Commission made it a priority to have lights installed in those areas. There is a safety component, he said, and the lighting was recommended by the Police Department.

Resident Comments:

There were no resident comments.

Next Meeting:

The tentative date for the next meeting will be June 10, 2024.

The meeting adjourned at 4:00 o'clock p.m.

4.


4186
arGo
Green!
FARGO


4186
Far Go Green!
4186

Sustainability & Resiliency Committee,

Thank you for the bus wrap contest.
It truly was an honor to be chosen!
It was such a pleasure to have a
once in a life time opportunity to have
my art on a bus!

-Kaylee Trana

City of Fargo Clean-up Week 2024

Scott Olson, PE , Solid Waste Utility Director
Jen Pickett, Recycling Supervisor
Solid Waste Utility

Agenda

- 2024 Recap
- General Rules & Acceptable/Not Acceptable Items
- Challenges
- Challenges with Recyclables
- Diversion Methods on Street
- Residential Transfer Station

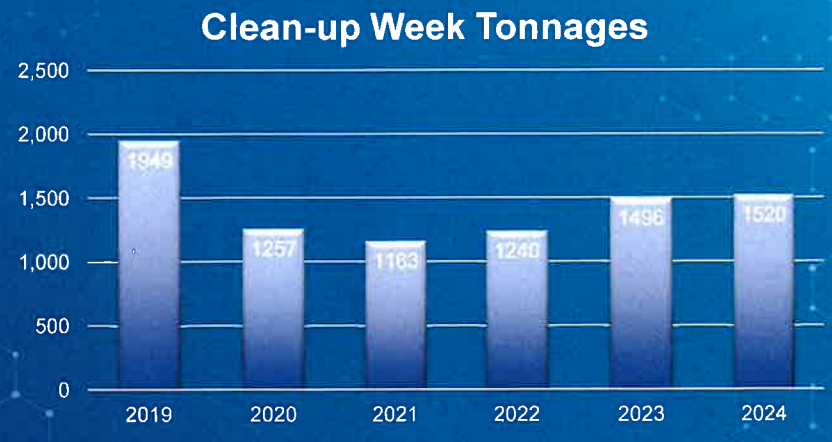
2

2024 Recap

- Weeks of May 6-10 and May 13-17
- Collaboration between Solid Waste, Public Works and three private contractors. Requires use of haul trucks, multiple loaders, skid steers, and manpower of nearly 150.
- 1,520 Tons of material collected
  - 764 Loads from curbs
  - 221 Loads delivered to Residential Transfer Station
- 33 Tons of Tires (2,092 Tires = Two Semi-Loads) collected and recycled
- 140 Tons of Metal collected and recycled

3

2024 Recap (cont)



4

General Rules and Acceptable/Not Acceptable Items

- Your day is the same as your recycling day
- Items to be set out on the boulevard before 7am on scheduled day
- Limit of two appliances (remove refrigerator and freezer doors)
- Limit of 4 tires
- Electronics, stains, paints and other household hazardous waste should not be set out.
  Household Hazardous Waste Facility open year round to residents for these items and allows for items to be properly recycled or reused
- No building materials such as wood (lumber, construction, etc.) or concrete
- Brush to be collected as well

Reminders

- Please separate items so the proper units can be dispatched to collect and not need to sort at curb
- Place smaller household waste items in disposable containers
- Residents can be charged for overly excessive piles

https://fargond.gov/city-government/departments/solid-waste/residential-recycling/cleanup-week

5

Challenges

- Excessive Piles – Requires additional resources during an already hectic time
- Non-Sorted Debris Piles - Requires additional time to collect by various crews
- Piles Placed at Curb too Early – May cause disruption of sorted piles, and items may become weather impacted

6

Challenges (cont)

Excessive Piles

If it seems excessive – It probably is.

7

Challenges (cont) – good vs bad

Good – Separated by Item. Orderly

Bad

8

Challenges with Recyclables

- Separating Items – homeowner to separate at the curb. Also a problem in recycling as a whole.
- Workplace Hazards – difficult to require staff and contract help to go through others' waste to separate potentially recyclable items
- Contamination – Other wastes impacting salvageable recyclables. Often turned away at recycling centers
- Logistics – Would require a significant addition in workforce and/or time to the clean-up week event.

For this reason, the City of Fargo has focused recycling efforts on easily distinguishable items, such as metal and tires. **We encourage residents to donate lightly used items to local thrift stores for reuse.**

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Diversion Methods on Street

Metal and Appliances
Metal and appliances are collected by designated crews and turned in locally to be salvaged and/or recycled.

Nearly 140 Tons of metals were collected and recycled in 2024

Tires
Tires (limit 4 per household) are collected by designated crews and delivered to Solid Waste Central. A contractor (Liberty Tire in 2024) is then selected to take tires to be recycled and out of the landfill.

Over 2,000 tires were collected in 2024 to be recycled, which required two semi-loads.

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Residential Transfer Station

Beginning in January of 2021, the Residential Transfer Station was made available to residents of Fargo to haul and dispose of unwanted debris, larger items, recyclables, batteries and tires, at no charge, year round with proof of residency.

Benfits:

- Gives residents a chance to get items out of their house any time and not wait for Clean-up Week.
- Staffed during open hours to assist in diverting recyclable materials.
- Safe, indoor environment for residents to utilize.
- Helps City achieve reduction goals.
- Free

2023 Residential Garbage – 1,059 Tons
2023 Transfer Station Metal Recycled – 132 Tons
2023 Cardboard Recycled – 22 Tons
2023 Electronics, paints, stains, oils, etc Recycled or Reused at HHW – 115 Tons

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Residential Transfer Station (cont)

12

Questions

13

LED Lighting

Effects on human biology & why we should care

LED vs Incandescent

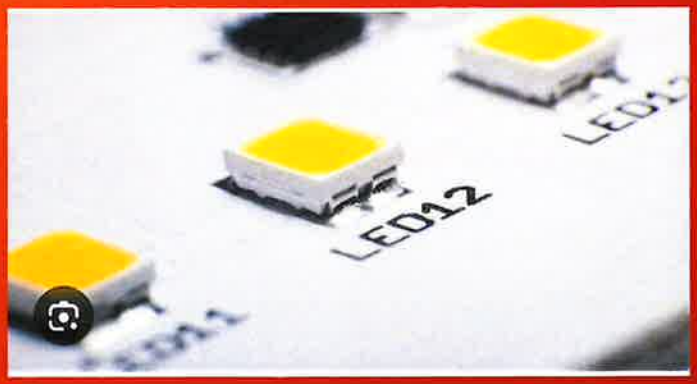
- **LED**= **Light Emitting Diode**, essentially a cluster of computer chips
  -- Does not occur in nature

- **Incandescent**= Electric light with a tungsten **filament** that is **heated** until it glows
  --Naturally occurring process

Incandescent bulb

The light bulb structure

LED



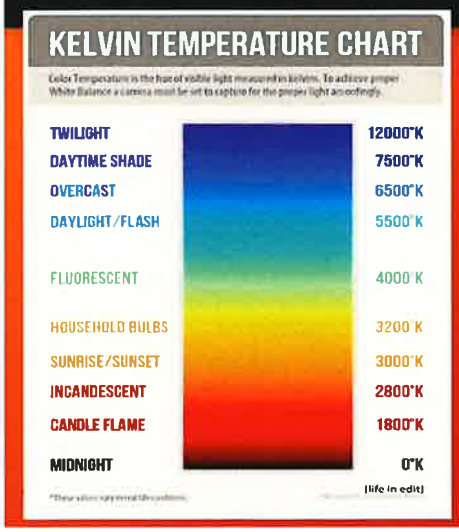
Energy Efficiency?

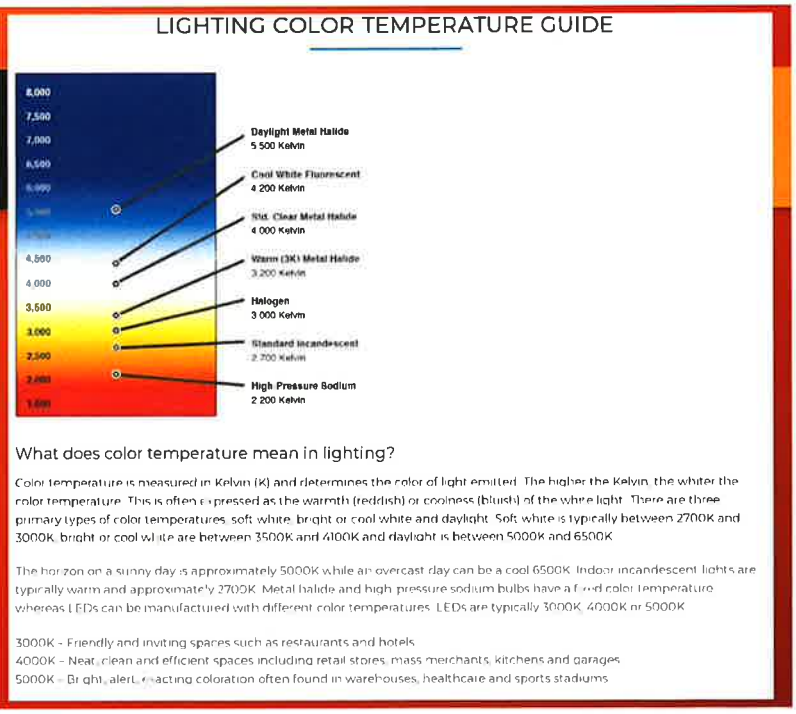
- Heat= How humans got their source of lighting since the beginning of time. Whether from the sun or fire.
- Heat requires more energy
- The sun is a NATIVE electro magnetic frequency (EMF)

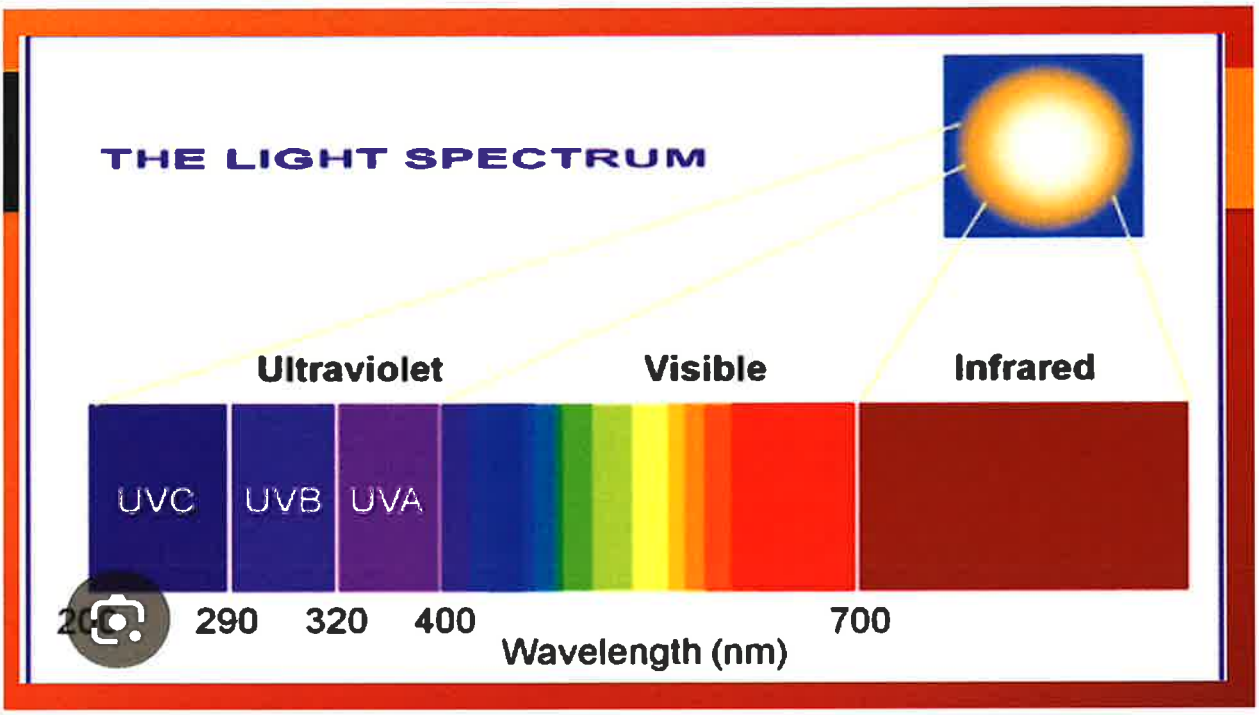
- LED is a NON-NATIVE electro magnetic frequency (EMF)
- Narrow frequency band of radiation is alien to humans.

-Does not occur in nature

Degrees Kelvin(K)







Color Temperature, Color Accuracy, and Color Rendering Index

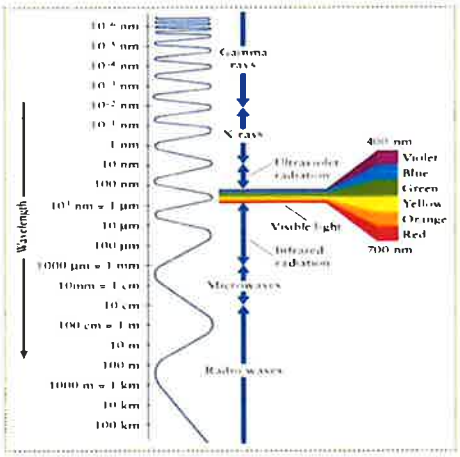
olor is an important aspect to lighting. Color can improve the image of a space, Color can improve the look of your products. Color can create or change he mood of the enbvironment. Color can affect your health. Here, we explore the technical aspects of light and the ways in which light is measured and pecified to get the results you desire

he main topics discussed on this page are.

- Wavelengths of visible Light
- Color Temperature
- Color Rendering Index

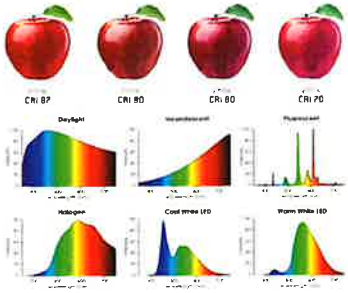
Wavelengths (Light Waves) of Visible Light

Light as we know it is made up of waves of electromagnetic radiation that fall within a specific range of wavelengths or frequencies. Within this narrow range of wavelengths, our eyes are able to detect and perceive visible light. Electromagnetic radiation outside the visible spectrum includes extremely short wavelengths that make up Gamma rays, X-Rays, and UV Rays. On the opposite end of the electromagnetic spectrum includes longer wavelengths such as Infrared, Microwaves, and Radio Waves



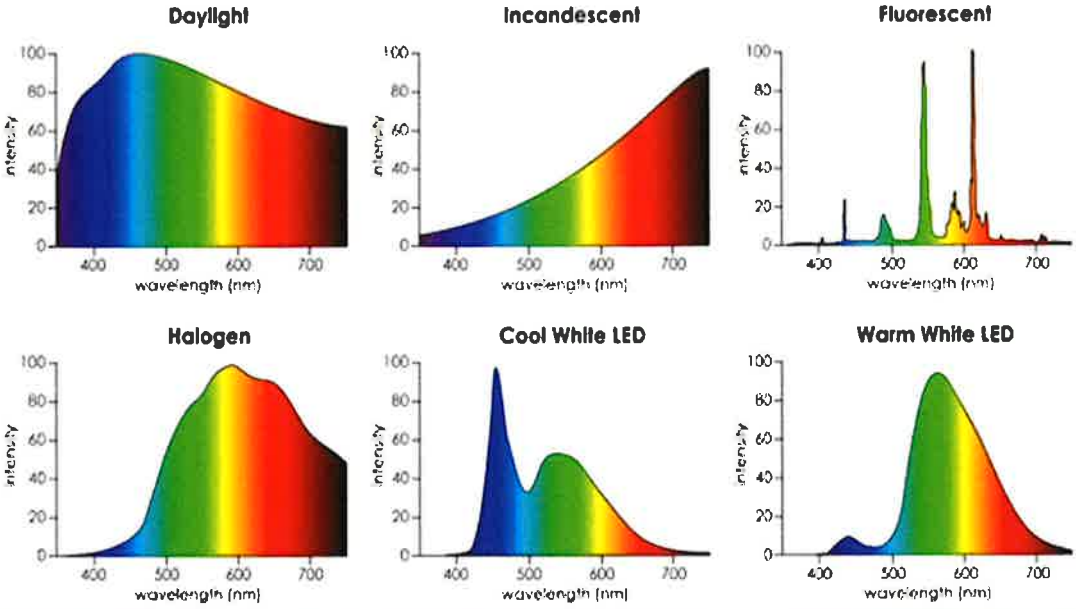
Color Rendering Index

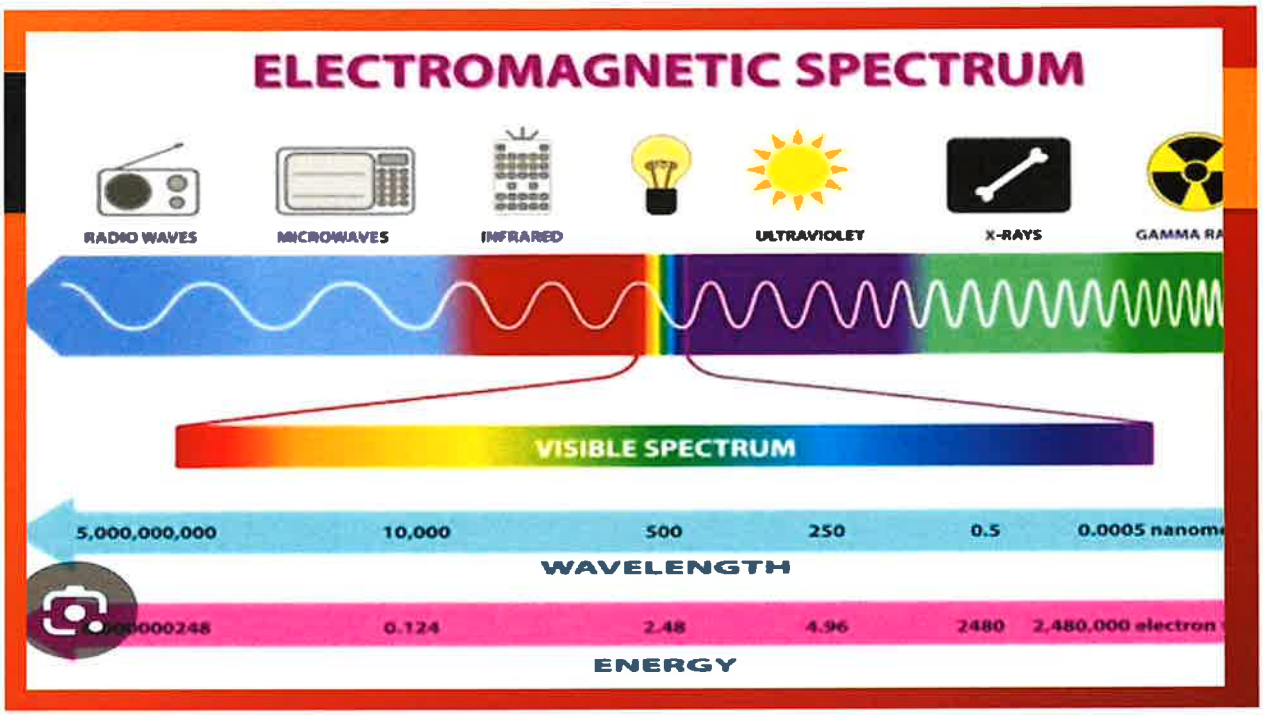
What is the Color Rendering Index (CRI)?



The simple definition would be the ability of a light source to precisely display all the possible frequencies of a certain spectrum as compared to the color temperature. It is ideally rated on a scale ranging from 1-100. Natural sunlight has the highest CRI of 100, while LED lights nowadays have the range from 75 to 90. Higher CRI is more expensive in general.

The lower the CRI the less accurately will the colors be reproduced. The light sources that have blazing radiators tend to have a CRI of about 100 since all the colors in the CRI spectrum are shown equally in its form. For example, you can see an apple has "wine red" color under sunlight, they will have "dark pink" color under the low CRI lights. What is the importance? For some special occasions such as art gallery and museum, the lighting requires up to 95+ CRI to allow the visitors to see the "real" colors.





Flicker

100-120 times per second

The result is that an LED bulb may flicker between its on and off states at **100-120 times per second**. Figure 1: A graph showing the alternating current waveform, which repeats 50-60 times per second. Even a simple rectified AC signal will cause an LED to flicker at 100-120 times per second.

When you record lights with a mirrorless, DSLR or phone camera, they really do flicker on the screen. Led lights flicker due to the stroboscopic effect, but the human eye cannot see it when it happens rapidly (about 60 to 1 000 times per second or more). These anomalies can be detected with mirrorless cameras and smartphones.

When the camera and LEDs have different frame rates, the flicker effect is clearer. This is particularly evident when shooting video in slow motion or at fast frame rates (FPS).

What is the stroboscopic effect?

You may have readabout "persistence" in your old physics textbooks. It is a feature that makes it difficult to forget what we see. We can still see something, even if it is no longer in our field of vision. As a result, we see life as a continuous flow rather than a collection of fragmented images. The easiest way to test this phenomenon is to look towards the light source and quickly close your eyes. You can still see the light.

The LEDs flicker invisibly to the naked eye because they switch on and off quickly. That's why it seems as if the lights are constantly on when they are switched off and on at a rapid pace. Videos, on the other hand, consist of several consecutive images. These video scenes are recorded at high frame rates per second (FPS), more commonly 24 or 30 frames per second. Our brains think that everything on the screen moves in a single, smooth motion when this effect is used in combination with other "tricks".

When the video frame rate (FPS) does not match the light frequency at which the LEDs turn on and off per second, the screen starts to flicker. It seems that there is a problem with the screen, even though there is nothing wrong with it.

The flickering (and buzzing) of LEDs is entirely due to the electricity supplied to them. The LEDs alternate on and off as they flicker and are controlled by electricity.

The LED usually flashes so quickly that the human eye cannot distinguish it. The flicker captured on camera is undoubtedly due to the light working properly. It is only when you can see the LED flashing with the naked eye that you should be concerned. We have written more about flicker in our article How to fix flickering led strip? In it, we deal with the flickering of a faulty strip.

Flicker Effects

Incandescent bulbs are lit with a glowing filament, so they do not have a constant on-off type flicker

Flicker rates can have negative health effects, including:

- Up to 70 Hz: Seizures, headaches, fatigue, blurred vision, eyestrain, and reduced visual task performance
- Up to 200 Hz: Negative health effects have been documented

The IEEE 1789 recommends a safe flicker percentage of 8% for low risk flicker and 3% to completely eliminate the effects of flicker. Flicker frequency also plays an important role in lighting quality. A lower flicker percentage and a higher flicker frequency can make light less disruptive. For example, a PWM frequency of 25 kHz (25,000 Hz) or higher can eliminate flicker, and increasing the frequency to above 20 kHz can eliminate audible buzzing or whining sounds.

Melatonin

- Stored in the mitochondria.
- #1 anti-cancer
- #1 antioxidant agent in the body
- Fights free-radicals, diseases, aging
- Near infrared lighting stimulates the production of melatonin
- Blue light shuts down melatonin production
- Studies about blue light exposure to the skin also shut down melatonin production and release for 3-4 hours after exposure

Natural Sunlight- healing properties

- Windows/ windshields block certain spectrum (healing)

-Lots of windows in a home does not= lots of "natural light"

Same thing goes for wearing glasses and sunglasses

- Daylight produces the full-spectrum of light, including the reparative infrared spectrum

Hot Body Measurement

- Electromagnetic radiation emitted

Fire=2300k Incandescent=2700k

- The higher the #, the more radiation exposure
- Blue light can appear white in LEDs.

-Non-native, alien source of biological stress created by modern technology.

-Narrow range of light

-Disruptive to circadian biology

Harms

- Short wave-lengths have the highest impact (LED)
- Create reactive oxygen species
- Induce metabolic stress
- Damage cellular function
- Able to get behind the retina and cause macular degeneration and cataracts.

- Long wave-lengths repairs and helps generate cells (Incandescent)
- Turn food energy into usable energy- just like plants

Fargo lights

Diffusers

- Street lights do not have a diffuser
- Create glare- making it dangerous, especially when road surfaces are wet

ATP's Comfort Diffuser®, th...

ATP's Comfort Diffuser®, th...

What is the purpose of a diffuser in LED lights?

LED diffusers are designed **to spread light across a room.** You can use a diffuser to cast a soft light across the entire room, making it easier on the eyes to do things such as work on a computer or read. Diffusers can be used in any room where you want to create a more soothing and relaxing atmosphere.

Contact

- Kristina Klinkhammer

krisjoklink8907@gmail.com

701-412-8698

Thank you all for your time!