

# Supporting Legacy Devices

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# Supporters

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# Thoughts

- Energy-efficiency is about saving power
  - IEEE P802.3az can offer simple solutions to save power
  - Power saving has some implementation dependency
    - Good for the market as vendors can use power savings as competitive stance
- Not about creating a new market
  - Interoperability with legacy equipment is required
  - Economic viability requires broader use of existing market
- Need to keep this project simple
  - Increased cost of components make EEE less palatable
  - Simpler effort enables faster deployment

# Idle Modes

- Normal idle
  - Only mode of operation for legacy, non-EEE devices
  - Devices are fully powered
- Listening response idle (LRI)
  - Power reduction with fast response time
  - EEE device interacting with non-EEE device
    - Decreased power consumption with minimal response time impact
    - Permits support of existing legacy devices
  - Power saving for EEE devices w/ traffic preventing LPI mode
    - Use traffic monitoring to select between LRI and LPI
    - Traffic monitor can be left up to the vendor
- Low-power idle (LPI)
  - Only capable with EEE devices
  - Greatest power savings with longer response time

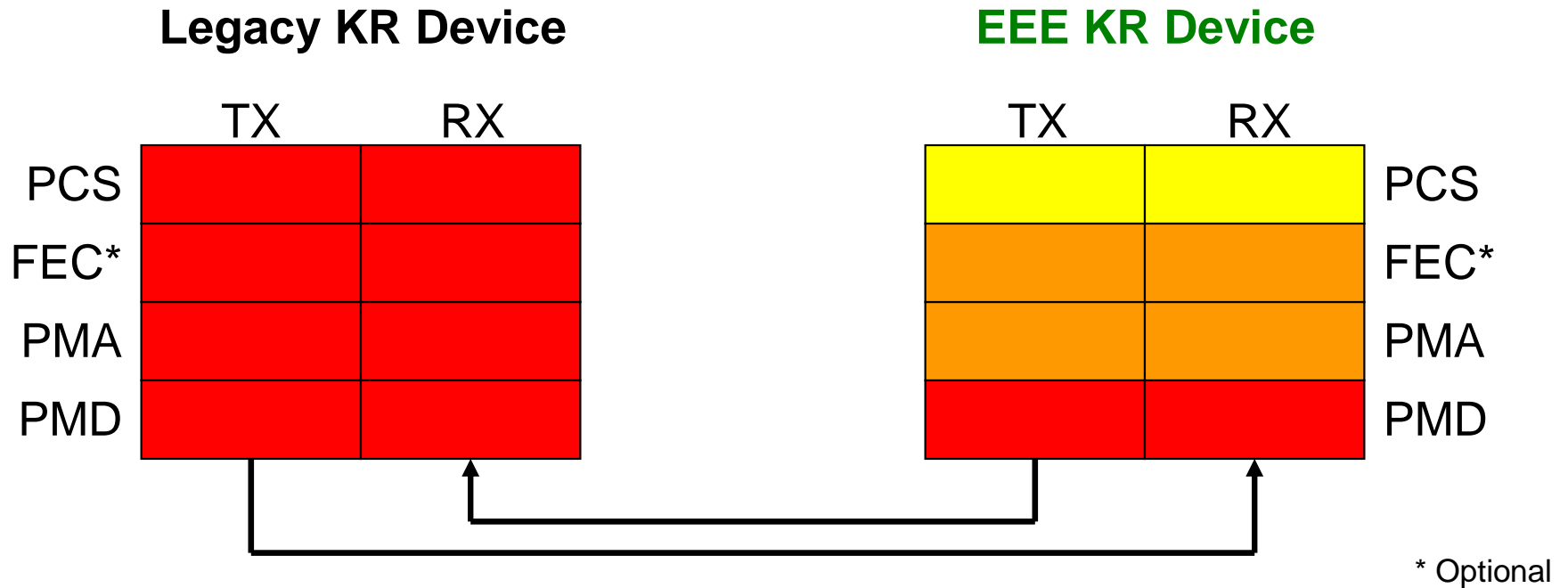
# Power Saving Idles

- Provide two power saving levels
  - Depth of power saving impacts response time
  - More than 2 is overkill
    - Has been observed with other efforts such as PCIe, WOL, etc.
- Listening response idle (LRI)
  - Permits interconnect with legacy Ethernet PHYs
  - EEE interconnects can select based on traffic monitoring
  - Response time > 2 orders of magnitude faster than LPI
- Low-power idle (LPI)
  - Per other presentations being made
  - EEE interconnect only
  - Devices use a specific indication to “wake up”
  - Response time is PHY dependent

# Listening Response Idle

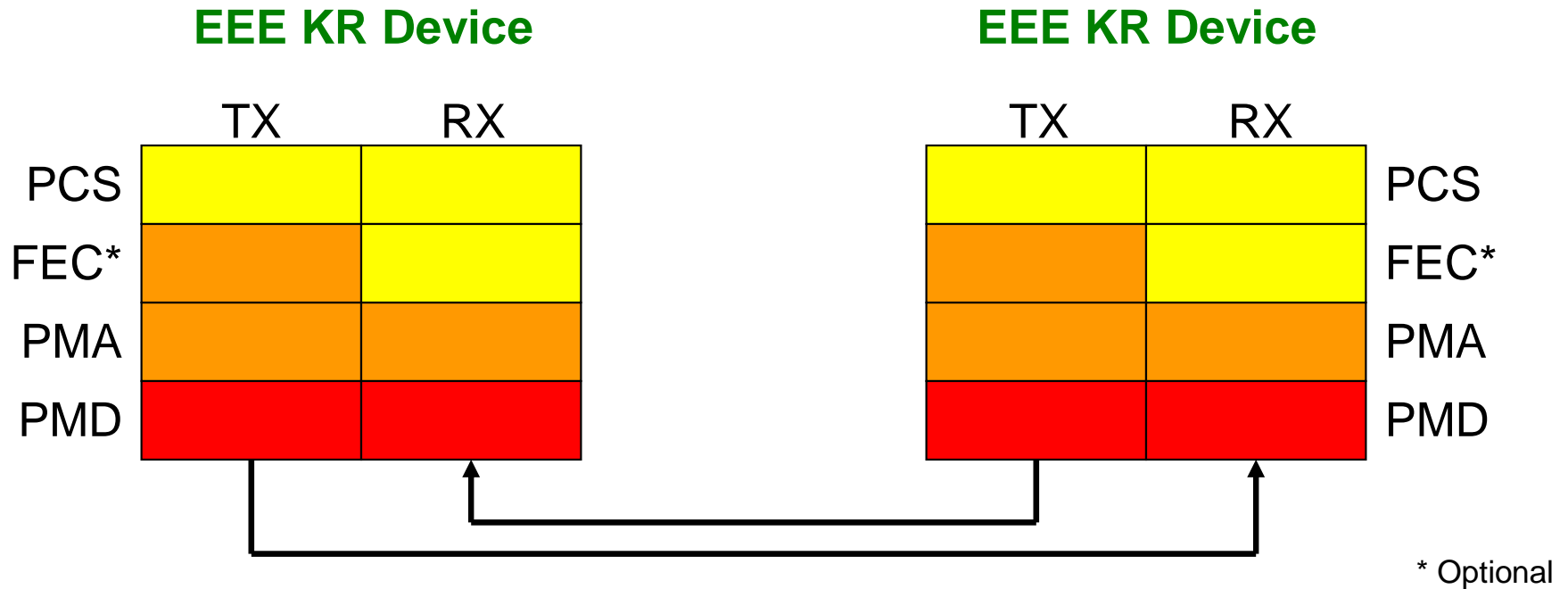
- An EEE capable device connected to a non-EEE device
  - EEE device capable of saving power
- EEE device receiver reacts quickly
  - Non-EEE device doesn't understand power conservation
  - Receiver monitors for incoming packets
  - Response time the same for legacy and EEE devices
- Legacy device must be kept linked
  - Mimic real idle patterns
  - EEE device transmits packets when requested by its MAC

# 10GBASE-KR Legacy LRI Example



- EEE device saves power
- EEE RX CDR, sync, align running looking for packets
- EEE TX mimics an idle stream to keep legacy RX linked

# 10GBASE-KR EEE LRI Example



- EEE devices save power, require quick response
- RX CDR, sync, align running looking for packets
- TX mimics an idle stream to keep RX linked



# Summary

- Legacy devices need to be considered for Broad Market Potential
- Recommend considering two power saving idle modes
  - Low-power idle is being well defined in other presentations
  - Consider addition of listening response idle

# Thank You!

- Questions?