Trends of the market
OEMs, suppliers, and Lighting suppliers

Hector Fratty, A2S CEO

Valeo Lighting CTO, DVN Founder and CEO

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Automotive Systems Strategy Consulting

A2S Consulting is an independent consulting firm with a deep knowledge and experience of the Global Automotive market.

We focus on 3 support activities:

1. **Business Development**
   - Leveraging contacts with OEMs (Audi, BMW, Mercedes-Benz, Renault, Stellantis, VW...) and long-established relationships with the main lighting Tier Ones: Hella, Marelli AL, OP Mobility, Valeo, ZKW.
2. **Strategy**
   - Team of former CEOs, CFO, CTOs with Global Tier Ones (FORVIA, Valeo, …)
3. **M&A and Partnerships**
   - Knowledge of the worldwide lighting market

We offer you:

1. **Proven Expertise in the automotive lighting industry**
   - Comprehensive understanding of the lighting ecosystem
2. **Hands-on Experience**
   - Large automotive experience in strategy execution, industrial footprint, and engineering transformation, Joint venture, partnership, and turnaround
3. **Market Knowledge and Data Access thanks to:**
   - Strong link with DVN
   - Worldwide presence in universities, institutional organization, and regulations through a Network of specialists and the experience at DVN

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Lighting Trends Toward 2030

Contents

- Report “Lighting Trends Towards 2030 and Beyond”
- General trends of the lighting Market/Industry
- Four Suggestions for leveraging lighting trends industry

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Lighting Trends Toward 2030

How to proceed

- Mega Trends of the automotive industry, mainly electrification, autonomous driving, SDV, connectivity, affordability, sustainability.
- Literature automotive lighting, and different events, VISION, ISAL, DVN WS and other congresses in the world.
- Interviews with designers, lighting experts, managers, marketing professionals from OEM and suppliers.

Adding my experience and help of my network.

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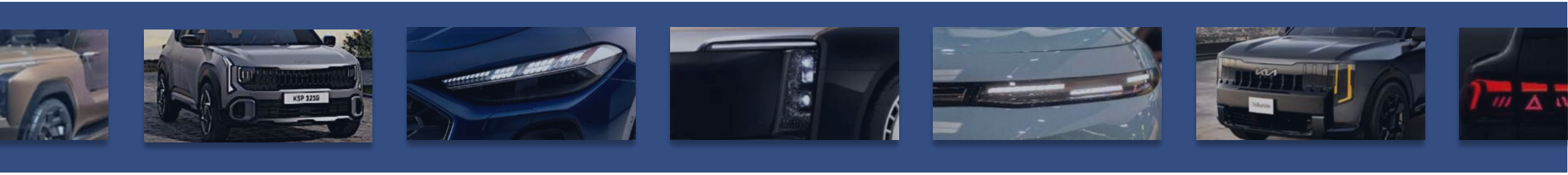

Lighting Trends Towards 2030 and Beyond

Suggestions and Challenges

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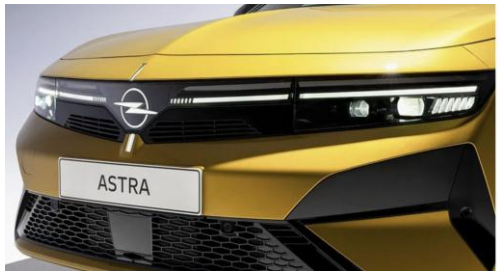
Lighting Trends – Part 1

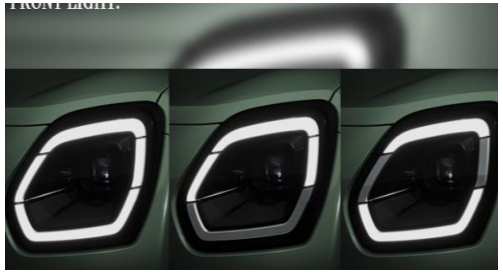
Quality and Safety features are at a good level. No need for improvement

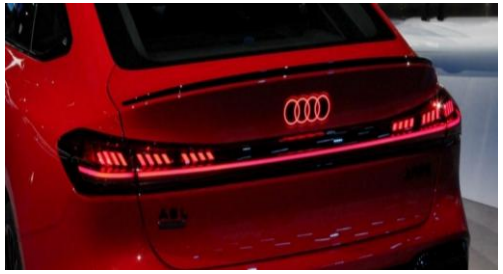
Cost and Development Time Reductions
Strong OEM needs while harder competition with new-comers able to reduce cost and TTM.

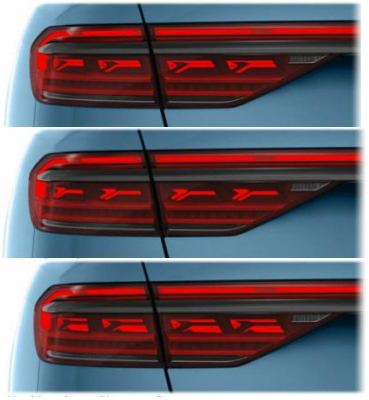
Light signature/Design differentiation
Car design
from “discrete lighting components attached to the car” to “Body Light”
Current lights
DRLs, front/rear lights, stop/DI lights, HL, used for differentiation/signature



Personalization
Different shapes of front/rear lamps for the same model of:
DRLs, front/rear lights, headlamps







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Lighting Trends – Part 2

- **Communication**
  Light projection, Entertainment

- **New lights and new functions**
  Illuminated logos, grilles, specific lights, AV lights

- **Sustainability**
  Adaptive light, Output efficiency, Remanufacturing, Repairability, Recycling

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Suggestions leveraging these trends

Cost, development time reductions

Design

Functions

Technologies

Sustainability

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Example 1 - How to Reduce Cost and Development Time

Closer OEM/Quality, Purchase, Engineering – Supplier to simplify specifications
Integrate quality controls early in the design phase.
Maintain tight feedback loops, simplify specs, achieve faster continuous improvement.
Discipline and agility with a prohibited design change.

Closer OEM/Studio – Supplier to propose creative solutions
Integrate studio early in the design phase.
Build strong intimacy, enabling faster decisions, fewer meetings, reduced lead times.

More affordable innovations
OEMs to ask suppliers to optimize innovation cost rather than creating innovations.
Example of light projection, logo, decorative parts.

More standardization of components and modules
Standardize components, use modular platforms, scalability.

Greater use of advanced engineering tools
Leveraging AI, Optical/Thermal/Condensation/Electronics simulations
for development and validation.

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Example 2 - How to prepare arrival of AV Lights

New lights for differentiation

Emphasize the brand signature, like done with DRL.
Use new specific lights and displays to emphasize the light signature.
More communication V2X perfectly understood in all the world.

Light specifications adapted to AV

Less lighting performance concerning range and less glare.
More lighting performance to enlighten areas for camera.
The long-range visibility will be got by IR light, without providing glare.
Regulations to accelerate.

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Example 3 - How to Limit Glare

Full automatic aiming will be a Must

No glare from any light when perfect aiming. Glare comes from bad dynamic aiming.
Integrate static and dynamic pitch variations, including load, acceleration/braking, changes in roadway grade, hills, and slopes.

Adaptive light to decrease light pollution

Lighting beyond simple illumination, emotional, social, but:
Avoid too many lights
Integrate light environment

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Example 4 - How to improve Sustainability

Full Adaptive light
Quality of light in relation with lighting environment.

Energy efficiency
Based on the high efficiency of optics.

Design for remanufacturing
Lamps will be removable, and everything will be done to avoid buying a complete replacement assembly after a lamp has been hit in a crash.
The remanufacturing process includes selected components, specialized assembly, testing

Design for repairability
Avoid buying a complete replacement assembly after a lamp has been hit in a crash.
Example with removable external lens and some componants

Design for recyclability
Use recyclable material and work for recyclability

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