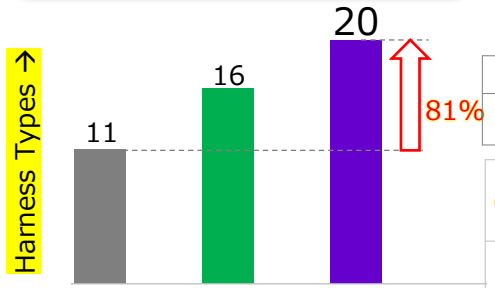
Part Strategy – Wire Harness

● Wire Harness → Current Sitution

< Current Situation >



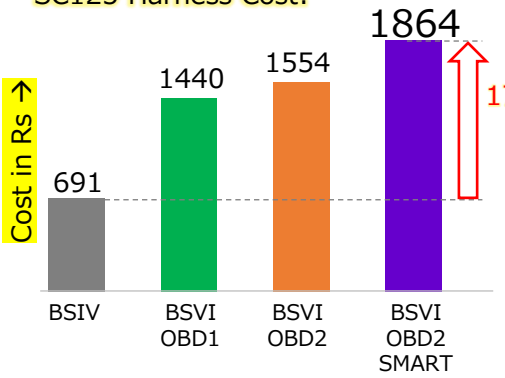
SC110	SC125	MC110	MC125	Total
				8

Specification Variation in Child parts, Wires, Circuits

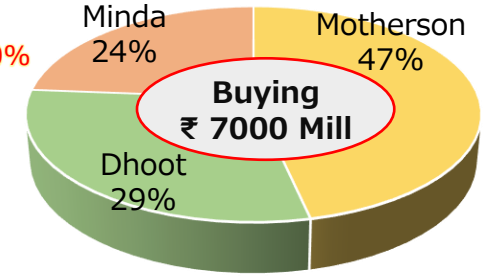
Model	Motorcycle			Scooter		
	K0N	K0V	K1C	K0L	K0P	K0Y
Maker	MSSL	MSSL/ DTPL	Minda	MSSL	Minda/ DTPL	MSSL/ DTPL
Child parts	90	91	85	88	81	82
Wire Qty	82	83	81	73	69	71
Circuits	75	69	73	64	61	65

Model Wise → High variation in child part and circuit design

SC125 Harness Cost:



Annual Harness Buying



*For 8 Models

Wire Harness Cost is Increasing with Each New Regulation

< Parameters Impacting Wire Harness Design → Current Situation >

Example: SC110

Wire
- Types – 4 Nos
- Colour – 38 Nos
- Dia – 4 Type
- Standard - JASO

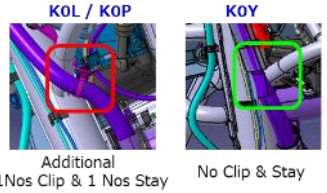
Clips
- Types – 4 Nos
- RM – High Cost PA66

Fuse/Fuse Box
- Qty - 9 Nos
- Types – 3 Nos
- 100% Import

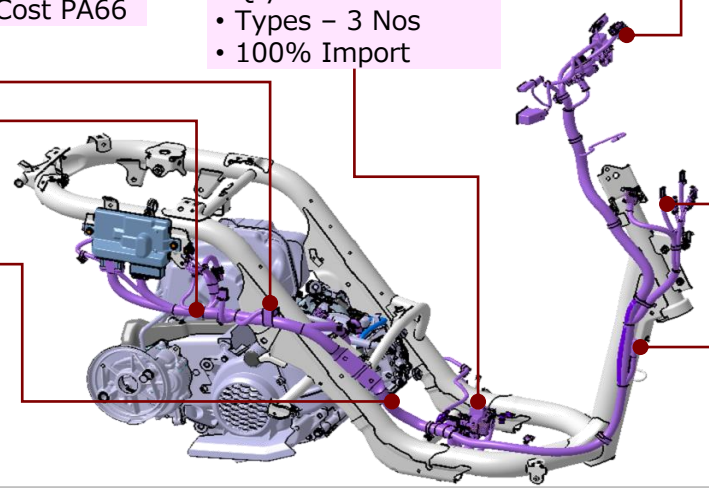
Couplers
- Types – 22 Nos
- RM – High Cost PBT /PA66
- Terminal Series – 6 Nos
- Waterproof – High Import

Connectors
- Types – 8
- Shape - Complex
- High Brass Composition
- Manufacturing Yield

Vehicle Layout
- Variation in Mounting
- Additional Metal Stays
- Total Wire Length



PVC Insulation
- Variations – 34
- RM - PVC
- PVC Tape – 100% Import
- Tape Width - 19mm



External Joints
- 3 Nos
- RM - High-Cost PVC
- Cap Thickness - 2mm
- Design Exclusive
- Exclusive Molding

Packing
- Less Optimize
- Corrugated Box

Manufacturing
- Separate Line /Model
- Set up Change Over : 210
- Kadai due to Exclusive Specification & Variation

High Variation in Specification, Increase in Cost due to regulation and Mfg. difficulty at suppliers.

● ③ 100Ki New Bird's-Eye View Theme [Apply Measures for 99Ki Kadai]

< CIC Activities – Harness Wire >

Year	Activity	Major Outcome
98Ki	Short Term CR	Coupler Elimination → Implemented MP Running Change
99Ki	Pre-C [K0N & K0L] Maker - Motherson	Child part Localization → Mono-T → Not Accepted

Model Specific Study & CR for Spec Items Only

100Ki	Supplier Genba [Dhoot / Minda]	Mfg. Process → Complex Child Part→ High Spec

Need Bird's-Eye View Approach for Overall Optimization

< Situation Analysis – Spec & Manufacturing >

Parameters impacting constitution

① Wire
- Types – 4
- Colour – 38
- Standard - JASO

② Clips
- Types – 4
- RM – High Cost PA66

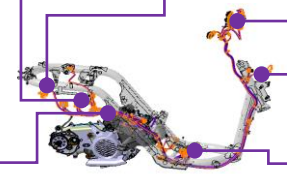
⑥ Couplers
- Types – 22
- RM – High Cost
- Waterproof–Import

⑦ Vehicle Layout
- Mounting Variation
- Metal Stays
- Wire Length

④ Terminals
- Types – 9
- Shape – Complex
- High Brass Composition

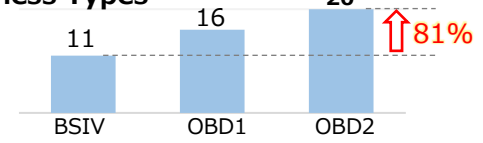
⑤ Protection Tube
- Variations – 34
- PVC Tape –Import

③ Fuse/Fuse Box
- Qty - 9
- Types – 3
- 100% Import

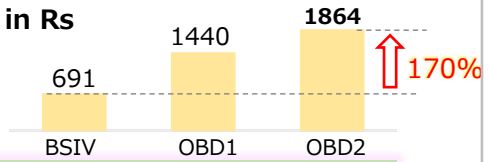


E.g. SC110

Harness Types



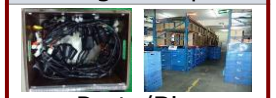
Cost in Rs



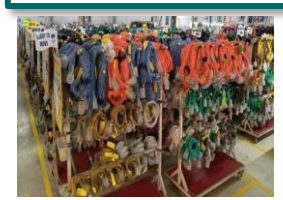
Buying ₹ 5500 Mill/year [8Model]

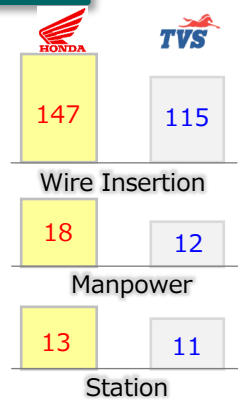
High Variation in Specification, leading to difficult Process and waste at Supplier→ Impact on Overall Constitution

< Supply Chain >

Material Receiving	Child part Inspect	Lead Preparation	Sub Assembly	Assembly	Circuit Testing	Final Inspection	Packing & Dispatch
							
High Import	Part Mixing	Change Over	No of Process	No of Lines	No of Circuits	Check Points	Parts/Bins

< Monozukuri Study>



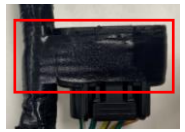


① Wire Insertion through CR Tube

Cycle Time
65 Sec
45 Sec

Kadai -Wire Entangled during Insertion

② Additional Process



Optional Taping → 4 Nos

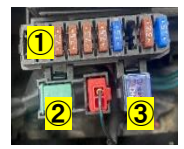
Std	No Optional Taping

Kadai -Extra manpower 2/day + Jig /Fixture

Many type of Waste at Supplier due to Specification variation

< Spec Comparison -SC >

Nos mtrs

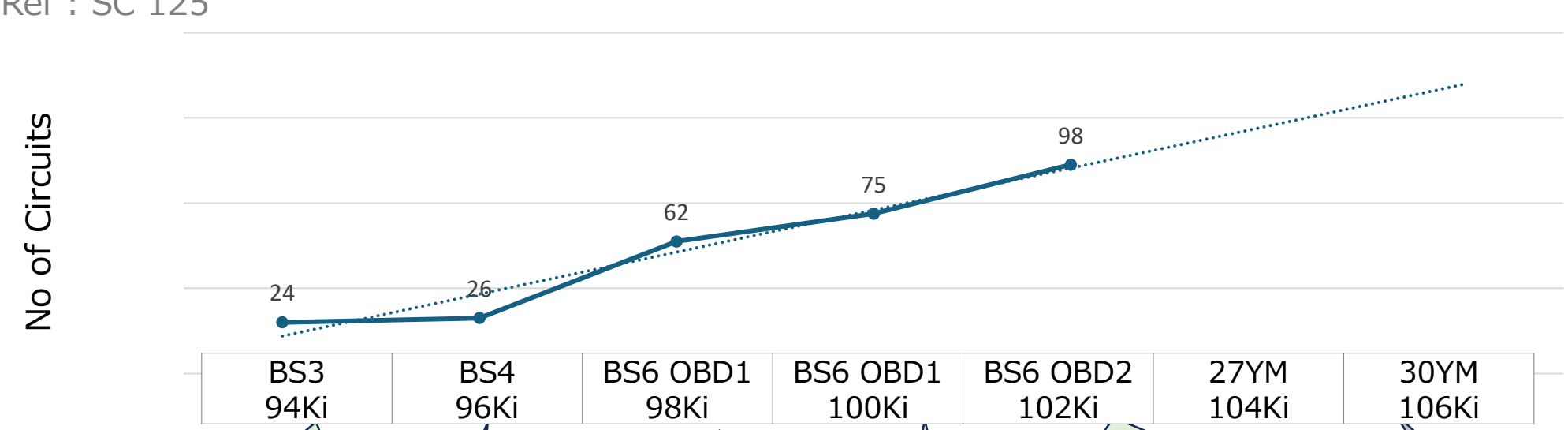
Wire→	<Color>	<Type>	<Combination>	<Length>	<Fuse Boxes>
HONDA	38 Activa 110	AVSS, AVSSF, AVSSH, AVS 4	59 Activa 110	82 Activa 110	 3 Activa 110
TVS	36 Jupiter 110	FLRY - B 1	45 Jupiter 110	64 Jupiter 110	 1 Jupiter 110

Wire harness has huge spec variation compared with Indian competitor

Considering Viewpoint of "**Indian Customer Acceptance**" → Need Overall Optimization with support of Mono-T [Technical Expert]

● Wire Harness → Spec History from BS3 to OBD2

Ref : SC 125



Regulations/Policy
Quality Requirement
Customer Feature Demands

- Basic Carburetor System
- All Bulb Lights
- Mechanical Speedometer

- Basic Carburetor System
- Introduction of LED HL
- Introduction of LED Position Lamp

- BS6 OBD1 Injector System
- Sensor Addition
- 1 Nos FI-ECU
- ACG Starter System
- Idle Start System

- BS6 Injector System
- Sensor Addition
- 1 Nos-ECU
- 1 ACG-ECU[Quality Rqrmt]
- ACG Starter System
- Smart key & ECU

- BS6 OBD2 Injector System
- Secondary O2 Sensor Addition
- Position Lamp
- 3 Nos ECU
- ACG Starter System
- SAB, TFT, USB Charger

Honda Policy[Carbon Neutrality]
- Flexi Fuel System

Features:
- All LED Lamps + Fog Lamp
- Boot Lamp
- GPS
- ABS, High Speed Alert
- Advance Smart Key

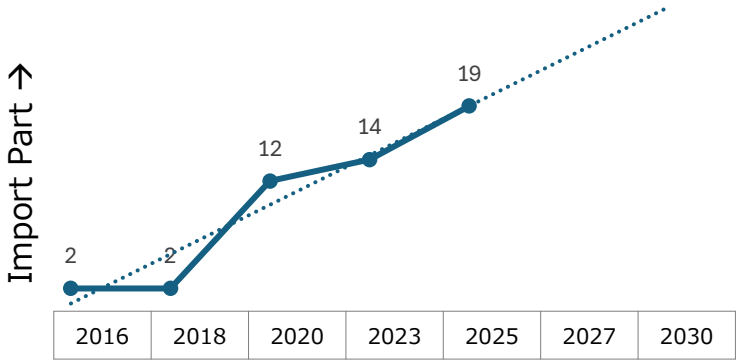
Possible Future Features Image after Discussion with Sales Team

Kadai : Specification Increase due to Regulation, Quality & Customer Feature Requirements

Scope : Need to Optimize Specification to Meet Future Requirement by Meeting Indian Acceptance Level

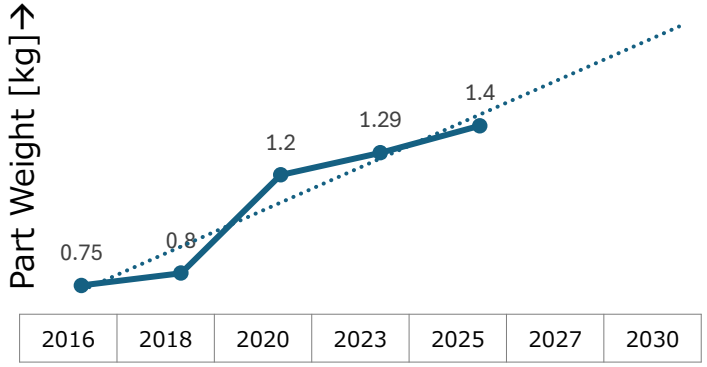
● Future Forecast Impacting Wire Harness

Make in India



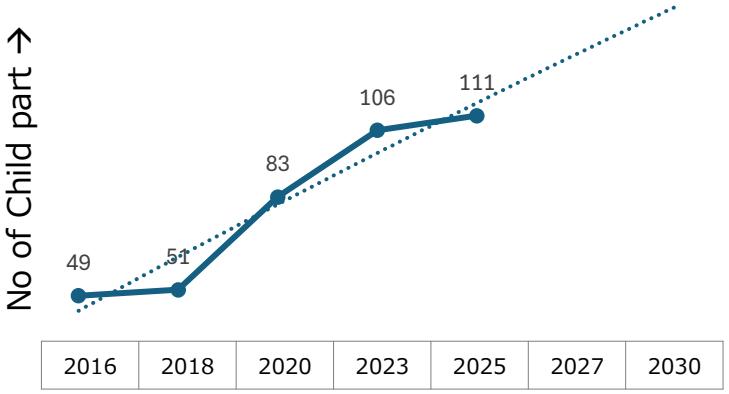
Impact Supply Chain of Import Parts

RM Price Fluctuation



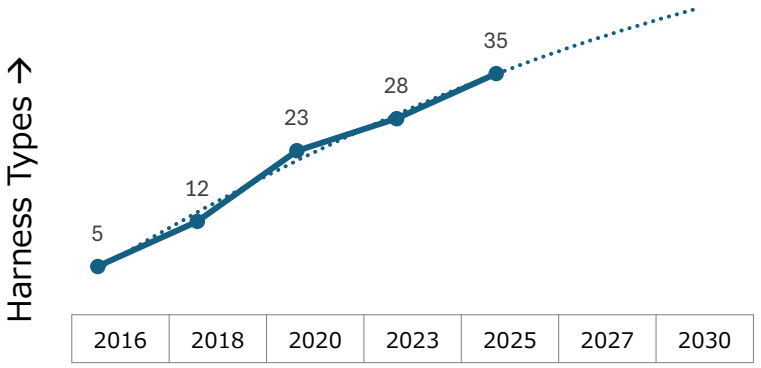
Impact on RM Cost

Manpower Oriented Process



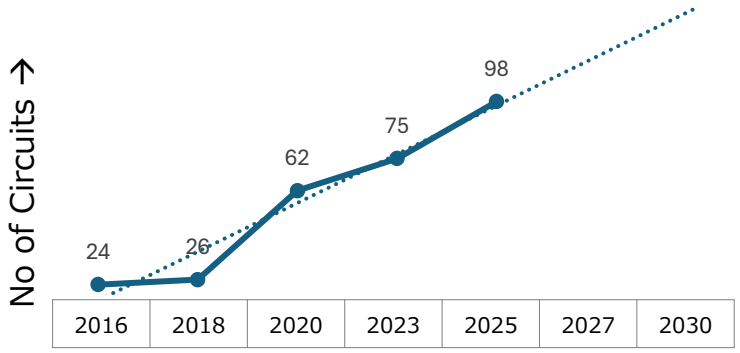
Automation Process Complexity ↑

Impact of EV



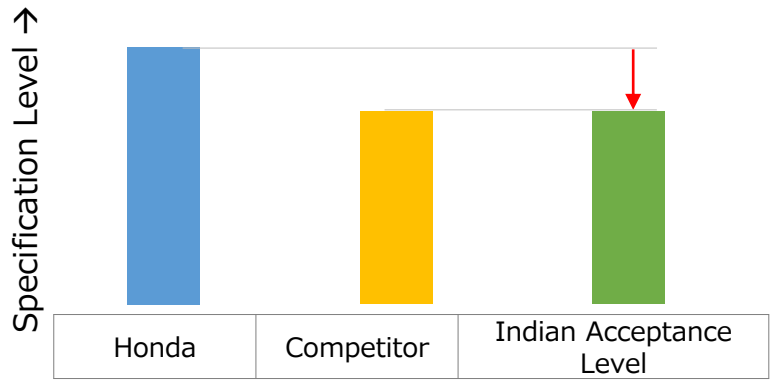
Monozukuri Constitution Impacted

New Feature Addition



No of Circuits ↑ → Cost Increase

Spec Benchmarking



Stringent Specification

Scope :

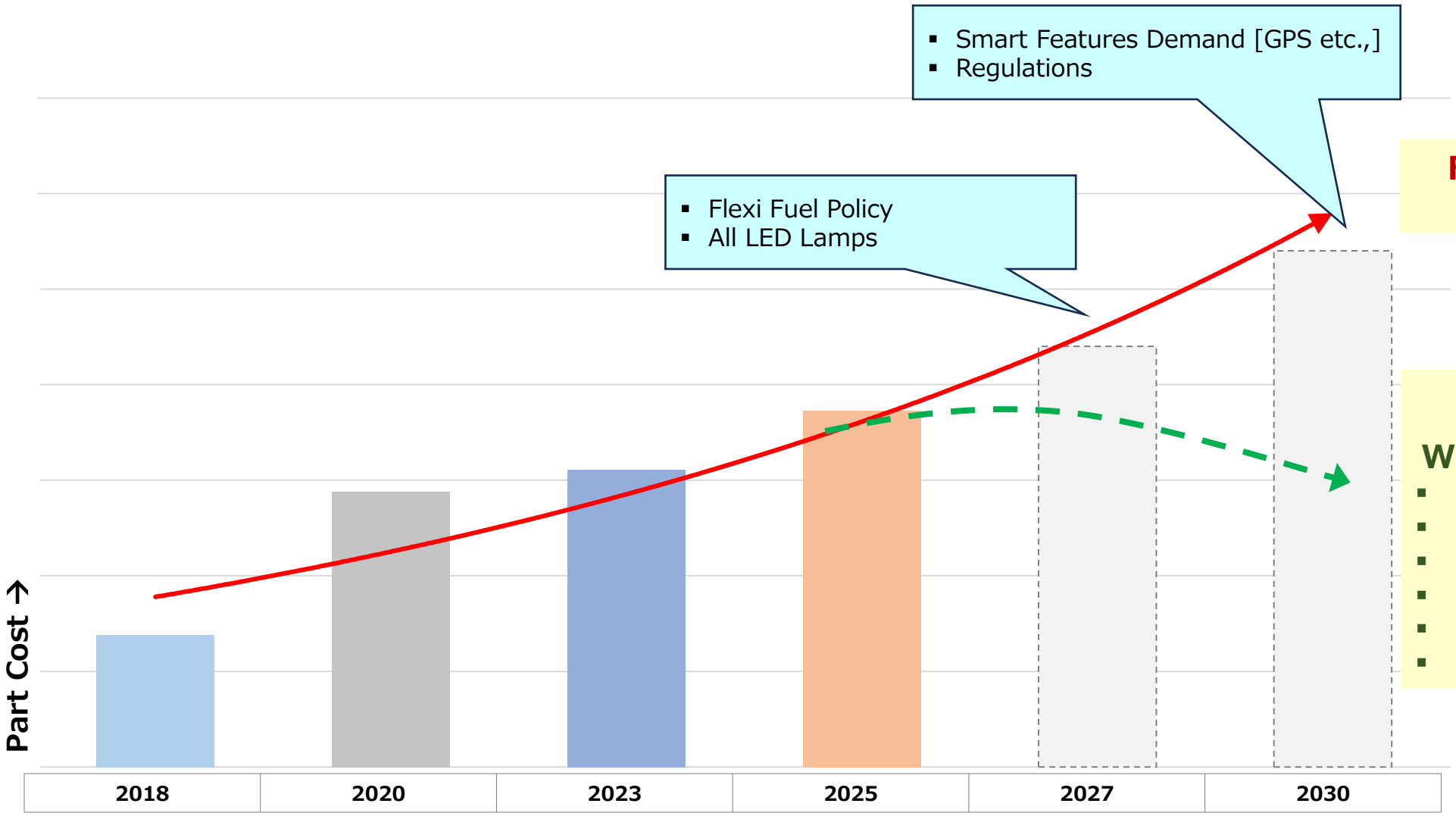
① Focus on Commonization of L1 and L2 Part

② Increase Automation in Wire Harness Assembly

③ Simplification of Wire Harness Design [1 Complex → 2 Simple Part]

④ Adopt Indian Customer Accepted Specification

● Nariyuki Situation



Future Cost Prediction [if No Action Taken]

Pro-Active Approach

With Harness Part Strategy

- Increase Localization
- Commonization
- Specification Optimization
- Automation
- Design Simplification
- Mfg. Kadai Elimination

Considering High Procurement, Specification Increase in Past, Situation with Indian Competitor & High Manpower Involvement and Future Forecast, There is Need for Wire Harness Part Strategy

● Bird's-Eye view : Wire Harness → Dream Design Vision

" Highest Cost Competitive Spec for Wire Harness "

K0P Indian OEM K0N Indian OEM

S.No	Child Part	Parameter	HMSI	Desired	Change Point	Reason
①	Wire	Standard	JASO D611	ISO 6722	Utilize Most Available Standard in India	ISO is 4% Cheaper Compared to JASO
		Types & Size	9	4	Single Standard Application [1 Type]	Setup Change Over losses , Total:60~80 Mins Loss/Day, 20% Extra Storage Area
		Length	85	64	25% Total Wire Length Reduction	Wire is Major Cost Factor for Harness
		Circuits	59	45	No of Circuit Reduction	33% Additional Circuits due to Global Design Standard
②	Coupler & Terminal	Import %	89%	50%	Minimize Import parts	Local Coupler is 25% Cheaper
		Series usage	025 → 61% 090 → 0%	025 → 0% 090 → 81%	Reduce Miniature & Complex Design Parts	090 Series is 50% Cheaper than 025 Series, Easy to Manufacture
		Terminal	Tin Plating 70:30	Minimal Tin 63:37	Optimize RM & Plating of Terminal	Tin Plating requires Additional Mfg. Cost and RM cost 63:37 is widely used in Indian OEM's
③	Fuse	System	9 Fuses	4 Fuses	Combine Functionality and Reduce Child Parts	HMSI use separate Fuse Protection for each circuit,
		Box	3	1	Increase Modular Design for Fuse Box	HMSI Exclusively use 40A Fuse & separate Fuse box
④	Insulation	Tubes[Qty] & Tape	34	15	Increase use of Generalised parts like Tape	Custom length & Diameter Design for Each Branch
		Caps, Covers [Nos]	17	9	Minimize Special Design Parts	Complex & Custom Design for each Coupler
⑤	Clips	Qty	4	2	Reduce Type of Parts	Purpose Specific Clips used for Routing of Harness
⑥	Layout & Assembly	Frame Stay [Nos]	16	8	Eliminate Indirect Process due to Harness Wire	HMSI use Clip band harness instead of Low-Cost Tie band [50% Cheaper]
		Breather Joints [Nos]	2	0	Low Cost Design adoption	Breather Joint increase Wire Length by + Additional Child Part