

Briefing - NSSPC 2026 Hackathon

AI + Supply Chain Hackathon: The Green Logistics Challenge (AI 赋能供应链黑客松：绿色物流挑战赛)

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The Green Logistics Challenge

Mr. Young is an Operations Director in a co-operative formed by several vegetable farms. He wants to implement a workable strategy that fulfils the following requirements:

1. Co-operative farms and locations (refer to the datasets)

1.1 The co-operative consists of multiple farms across three production clusters:

- Cameron Highlands (Pahang)
- Batang Berjuntai (Selangor)
- Air Hitam (Johor)

1.2 Each cluster has 5 to 10 farms joining the co-operative.

1.3 Each farm produces 2 to 3 types of vegetables (SKUs).

 Farms.csv
 Farm_Products.csv
 Products.csv

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Farms.csv

	A	B	C	D	E	F	G
1	farm_id	farm_name	location_id	location_name	lat	lon	harvest_days
2	F001	Cameron Farm 1	LOC_CH	Cameron Highlands (Pahang)	4.4867	101.37215	Mon,Wed,Fri
3	F002	Cameron Farm 2	LOC_CH	Cameron Highlands (Pahang)	4.49123	101.42199	Mon,Wed,Fri
4	F003	Cameron Farm 3	LOC_CH	Cameron Highlands (Pahang)	4.46478	101.36928	Mon,Wed,Fri
5	F004	Cameron Farm 4	LOC_CH	Cameron Highlands (Pahang)	4.51918	101.39932	Mon,Wed,Fri
6	F005	Cameron Farm 5	LOC_CH	Cameron Highlands (Pahang)	4.45772	101.39258	Mon,Wed,Fri
7	F006	Cameron Farm 6	LOC_CH	Cameron Highlands (Pahang)	4.4579	101.36233	Mon,Wed,Fri
8	F007	Cameron Farm 7	LOC_CH	Cameron Highlands (Pahang)	4.47906	101.3189	Mon,Wed,Fri
9	F008	Cameron Farm 8	LOC_CH	Cameron Highlands (Pahang)	4.42005	101.35943	Mon,Wed,Fri
10	F009	Batang Farm 1	LOC_BB	Batang Berjuntai (Selangor)	3.46062	101.66343	Mon,Wed,Fri
11	F010	Batang Farm 2	LOC_BB	Batang Berjuntai (Selangor)	3.46376	101.61163	Mon,Wed,Fri
12	F011	Batang Farm 3	LOC_BB	Batang Berjuntai (Selangor)	3.53497	101.64723	Mon,Wed,Fri
13	F012	Batang Farm 4	LOC_BB	Batang Berjuntai (Selangor)	3.49303	101.61126	Mon,Wed,Fri
14	F013	Batang Farm 5	LOC_BB	Batang Berjuntai (Selangor)	3.47467	101.65733	Mon,Wed,Fri
15	F014	Batang Farm 6	LOC_BB	Batang Berjuntai (Selangor)	3.45647	101.66527	Mon,Wed,Fri
16	F015	Batang Farm 7	LOC_BB	Batang Berjuntai (Selangor)	3.47298	101.64525	Mon,Wed,Fri
17	F016	Batang Farm 8	LOC_BB	Batang Berjuntai (Selangor)	3.47295	101.70957	Mon,Wed,Fri
18	F017	Air Farm 1	LOC_AH	Air Hitam (Johor)	1.9006	102.97127	Tue,Thu,Sat
19	F018	Air Farm 2	LOC_AH	Air Hitam (Johor)	1.92568	102.96637	Tue,Thu,Sat
20	F019	Air Farm 3	LOC_AH	Air Hitam (Johor)	1.90727	102.94421	Tue,Thu,Sat
21	F020	Air Farm 4	LOC_AH	Air Hitam (Johor)	1.86115	103.00891	Tue,Thu,Sat
22	F021	Air Farm 5	LOC_AH	Air Hitam (Johor)	1.92315	103.00814	Tue,Thu,Sat
23	F022	Air Farm 6	LOC_AH	Air Hitam (Johor)	1.89753	102.99397	Tue,Thu,Sat
24	F023	Air Farm 7	LOC_AH	Air Hitam (Johor)	1.85664	102.9814	Tue,Thu,Sat
25	F024	Air Farm 8	LOC_AH	Air Hitam (Johor)	1.88718	103.03471	Tue,Thu,Sat

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Farm_Products.csv

	A	B	C	D	E		A	B	C	D	E		A	B	C	D	E	
1	farm_id	sku_id	daily_capacity	unit_cost_rm	available_days	1	farm_id	sku_id	daily_capacity	unit_cost_rm	available_days	1	farm_id	sku_id	daily_capacity	unit_cost_rm	available_days	
2	F001	SKU_CAB	2000	15.58	Mon,Wed,Fri	22	F009	SKU_BOK	2000	33.23	Mon,Wed,Fri	43	F017	SKU_OKR	2000	19.97	Tue,Thu,Sat	
3	F001	SKU_OKR	2000	17.56	Mon,Wed,Fri	23	F009	SKU_TOM	2000	26.56	Mon,Wed,Fri	44	F017	SKU_KAI	2000	34.06	Tue,Thu,Sat	
4	F002	SKU_BOK	2000	15.74	Mon,Wed,Fri	24	F010	SKU_KAI	2000	20.73	Mon,Wed,Fri	45	F018	SKU_BOK	2000	15.49	Tue,Thu,Sat	
5	F002	SKU_CAR	2000	15.82	Mon,Wed,Fri	25	F010	SKU_CUC	2000	30.13	Mon,Wed,Fri	46	F018	SKU_SPI	2000	36.97	Tue,Thu,Sat	
6	F003	SKU_KAI	2000	31.25	Mon,Wed,Fri	26	F010	SKU_SPI	2000	21.69	Mon,Wed,Fri	47	F019	SKU_CUC	2000	33.67	Tue,Thu,Sat	
7	F003	SKU_CUC	2000	20.49	Mon,Wed,Fri	27	F011	SKU_BOK	2000	31.39	Mon,Wed,Fri	48	F019	SKU_CAB	2000	28.3	Tue,Thu,Sat	
8	F004	SKU_BOK	2000	32.45	Mon,Wed,Fri	28	F011	SKU_SPI	2000	37.12	Mon,Wed,Fri	49	F019	SKU_BOK	2000	39.45	Tue,Thu,Sat	
9	F004	SKU_OKR	2000	21.95	Mon,Wed,Fri	29	F012	SKU_TOM	2000	33.62	Mon,Wed,Fri	50	F020	SKU_TOM	2000	19.13	Tue,Thu,Sat	
10	F004	SKU_CAB	2000	33.93	Mon,Wed,Fri	30	F012	SKU_OKR	2000	21.57	Mon,Wed,Fri	51	F020	SKU_CHI	2000	36.81	Tue,Thu,Sat	
11	F005	SKU_LET	2000	23.97	Mon,Wed,Fri	31	F012	SKU_BOK	2000	25.71	Mon,Wed,Fri	52	F021	SKU_CUC	2000	17.79	Tue,Thu,Sat	
12	F005	SKU_BOK	2000	30.09	Mon,Wed,Fri	32	F013	SKU_SPI	2000	27.34	Mon,Wed,Fri	53	F021	SKU_KAI	2000	31.25	Tue,Thu,Sat	
13	F005	SKU_CAR	2000	28.24	Mon,Wed,Fri	33	F013	SKU_CUC	2000	31.53	Mon,Wed,Fri	54	F021	SKU_BOK	2000	37.49	Tue,Thu,Sat	
14	F006	SKU_CAR	2000	17.33	Mon,Wed,Fri	34	F013	SKU_TOM	2000	30.69	Mon,Wed,Fri	55	F022	SKU_LET	2000	23.45	Tue,Thu,Sat	
15	F006	SKU_LET	2000	30.46	Mon,Wed,Fri	35	F014	SKU_BOK	2000	29.9	Mon,Wed,Fri	56	F022	SKU_CUC	2000	23.85	Tue,Thu,Sat	
16	F007	SKU_BOK	2000	31.53	Mon,Wed,Fri	36	F014	SKU_LET	2000	28.23	Mon,Wed,Fri	57	F022	SKU_KAI	2000	20.51	Tue,Thu,Sat	
17	F007	SKU_CUC	2000	34.63	Mon,Wed,Fri	37	F014	SKU_CAR	2000	31.52	Mon,Wed,Fri	58	F023	SKU_CAB	2000	32.64	Tue,Thu,Sat	
18	F007	SKU_LET	2000	36.66	Mon,Wed,Fri	38	F015	SKU_LET	2000	34.21	Mon,Wed,Fri	59	F023	SKU_CUC	2000	11.77	Tue,Thu,Sat	
19	F008	SKU_OKR	2000	24.25	Mon,Wed,Fri	39	F015	SKU_KAI	2000	17.79	Mon,Wed,Fri	60	F024	SKU_OKR	2000	28.48	Tue,Thu,Sat	
20	F008	SKU_CHI	2000	31.75	Mon,Wed,Fri	40	F016	SKU_TOM	2000	36.9	Mon,Wed,Fri	61	F024	SKU_CHI	2000	38.39	Tue,Thu,Sat	
21	F008	SKU_SPI	2000	38.42	Mon,Wed,Fri	41	F016	SKU_CHI	2000	39.3	Mon,Wed,Fri							
						42	F016	SKU_CAB	2000	22.69	Mon,Wed,Fri							

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Products.csv

	A	B	C	D	E	F	G	H
1	sku_id	sku_name	category	pack_unit	shelf_life_ambient_h	shelf_life_cold_h	cold_required	spoilage_rate_per_h_after_limit
2	SKU_CAB	Cabbage	Leafy	box_10kg	72	168	0	0.004
3	SKU_LET	Lettuce	Leafy	box_8kg	12	72	1	0.01
4	SKU_TOM	Tomato	Fruiting	box_10kg	120	240	0	0.0025
5	SKU_CUC	Cucumber	Fruiting	box_10kg	72	120	0	0.004
6	SKU_OKR	Okra	Fruiting	box_6kg	48	96	0	0.006
7	SKU_SPI	Spinach	Leafy	box_5kg	8	48	1	0.015
8	SKU_CAR	Carrot	Root	box_10kg	168	336	0	0.0015
9	SKU_CHI	Chili	Fruiting	box_5kg	120	240	0	0.002
10	SKU_KAI	Kailan	Leafy	box_6kg	12	72	1	0.01
11	SKU_BOK	Bok Choy	Leafy	box_6kg	12	72	1	0.01

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2. Customers and service requirements (refer to the datasets)

- 2.1 Customers are located across all states in Peninsular Malaysia.
- 2.2 Customer types include supermarkets, wholesalers in pasar borong, community retail stores, and restaurants.
- 2.3 Some customers request cold-chain delivery; not all customers require it.
- 2.4 Freshness of products must be considered.

 Customers.csv

 Demand.csv

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Customers.csv

	A	B	C	D	E	F	G	H	I	J	K
1	customer_	customer_name	state	city	customer_typ	lat	lon	cold_storage_requested	delivery_window	max_lead_time_h	
2	C001	Ipoh Community 001	Perak	Ipoh	Community R	4.60665	101.0934	0	Mon,Wed,Fri 09:00-16:00	72	
3	C002	Seremban Supermarket 002	Negeri Sembilan	Seremban	Supermarket	2.7205	101.9475	1	Mon,Wed,Fri 09:00-16:00	48	
4	C003	George Town Wholesaler 003	Pulau Pinang	George Town	Wholesaler (P	5.41507	100.3385	0	Mon-Fri 08:00-17:00	24	
5	C004	Kuantan Supermarket 004	Pahang	Kuantan	Supermarket	3.80068	103.3227	1	Mon-Fri 08:00-17:00	36	
6	C005	Alor Setar Supermarket 005	Kedah	Alor Setar	Supermarket	6.11708	100.3524	1	Daily 06:00-14:00	72	
7	C006	Kota Bharu Supermarket 006	Kelantan	Kota Bharu	Supermarket	6.12836	102.2412	1	Mon-Fri 08:00-17:00	72	
8	C007	Batu Pahat Restaurant 007	Johor	Batu Pahat	Restaurant	1.85485	102.9302	0	Mon-Fri 08:00-17:00	24	
9	C008	Ipoh Community 008	Perak	Ipoh	Community R	4.58335	101.0859	0	Mon-Fri 08:00-17:00	24	
10	C009	Kangar Restaurant 009	Perlis	Kangar	Restaurant	6.43797	100.1906	0	Daily 06:00-14:00	72	
11	C010	Kuantan Wholesaler 010	Pahang	Kuantan	Wholesaler (P	3.80609	103.33	1	Mon,Wed,Fri 09:00-16:00	24	
12	C011	Batu Pahat Supermarket 011	Johor	Batu Pahat	Supermarket	1.87366	102.9343	1	Mon,Wed,Fri 09:00-16:00	48	
13	C012	Batu Pahat Restaurant 012	Johor	Batu Pahat	Restaurant	1.85738	102.9318	0	Tue-Sun 10:00-18:00	72	
14	C013	Batu Pahat Community 013	Johor	Batu Pahat	Community R	1.83561	102.9322	0	Mon,Wed,Fri 09:00-16:00	36	
15	C014	Alor Setar Supermarket 014	Kedah	Alor Setar	Supermarket	6.1216	100.3916	1	Mon-Fri 08:00-17:00	24	
16	C015	Shah Alam Restaurant 015	Selangor	Shah Alam	Restaurant	3.07188	101.5213	1	Mon,Wed,Fri 09:00-16:00	36	
17	C016	George Town Supermarket 016	Pulau Pinang	George Town	Supermarket	5.41375	100.3171	1	Daily 06:00-14:00	24	
18	C017	Kuantan Community 017	Pahang	Kuantan	Community R	3.81913	103.3335	0	Daily 06:00-14:00	72	
19	C018	Johor Bahru Supermarket 018	Johor	Johor Bahru	Supermarket	1.50061	103.7323	0	Daily 06:00-14:00	24	
20	C019	Shah Alam Community 019	Selangor	Shah Alam	Community R	3.08783	101.5043	0	Tue-Sun 10:00-18:00	48	
21	C020	Alor Setar Supermarket 020	Kedah	Alor Setar	Supermarket	6.12687	100.3889	1	Daily 06:00-14:00	48	
22	C021	Shah Alam Wholesaler 021	Selangor	Shah Alam	Wholesaler (P	3.06389	101.5126	0	Tue-Sun 10:00-18:00	72	
23	C022	Shah Alam Wholesaler 022	Selangor	Shah Alam	Wholesaler (P	3.0748	101.5133	0	Mon-Fri 08:00-17:00	24	
24	C023	Batu Pahat Wholesaler 023	Johor	Batu Pahat	Wholesaler (P	1.83929	102.9332	0	Mon-Fri 08:00-17:00	24	
25	C024	Johor Bahru Community 024	Johor	Johor Bahru	Community R	1.48208	103.7461	0	Daily 06:00-14:00	48	

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Demand.csv

	A	B	C	D	E
1	customer_sku_id	weekly_demand_mean_boxe	order_frequency_per_week	min_order_boxes	
2	C001	SKU_LET	52	3	15
3	C001	SKU_CAR	81	2	10
4	C001	SKU_SPI	39	3	5
5	C002	SKU_CAB	145	4	15
6	C002	SKU_KAI	80	5	5
7	C002	SKU_CUC	152	4	15
8	C002	SKU_TOM	99	5	10
9	C002	SKU_CHI	101	4	15
10	C002	SKU_BOK	77	5	5
11	C003	SKU_CAR	238	3	10
12	C003	SKU_BOK	208	2	10
13	C003	SKU_TOM	193	2	10
14	C003	SKU_OKR	268	3	10
15	C004	SKU_CHI	144	3	10
16	C004	SKU_CUC	125	5	15
17	C004	SKU_BOK	111	4	5
18	C004	SKU_CAR	147	3	15
19	C004	SKU_SPI	79	3	5
20	C004	SKU_LET	62	3	5
21	C005	SKU_CHI	173	5	15
22	C005	SKU_LET	67	5	15
23	C005	SKU_BOK	87	4	10
24	C005	SKU_CUC	91	3	15
25	C006	SKU_LET	65	5	15

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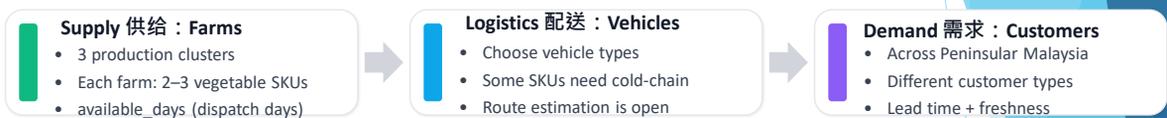
The Green Logistics Challenge

Vehicles

	A	B	C	D	E	F	G	H	I
1	vehicle_type_id	vehicle_type_nar	cold_capable	capacity_boxes	fixed_cost_per	avg_speed_kmpl	fuel_l_per_km	maintenance_rm_per_km	
2	VAN_AMB	Ambient Van	0	120	120	55	0.12	0.22	
3	LORRY_AMB	Ambient Lorry	0	500	280	50	0.32	0.3	
4	REEFER_TRK	Reefer Truck	1	400	450	48	0.38	0.36	

1) What are we solving? 题目在解决什么？

Vegetable co-op logistics: farms → customers (Peninsular Malaysia) with perishability + cold-chain



5.1 Hard constraint: All demand must be fulfilled 100% in all scenarios. If a proposal cannot meet demand, it is considered invalid.

5.2 Fuel price parameter (default unless organiser updates): FUEL_PRICE_RM_PER_L = 2.05. Teams must state the value used.

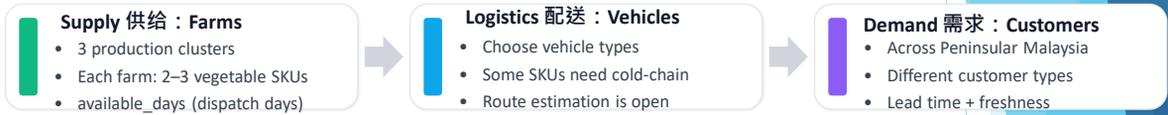
5.3 Minimum KPIs to report (Proposal A vs B, and selected proposal under scenarios):

- Total Cost (RM) = $\sum [\text{fixed_cost_per_trip_rm} + (\text{fuel_l_per_km} \times \text{FUEL_PRICE_RM_PER_L} + \text{maintenance_rm_per_km}) \times \text{distance_km}]$.
- Total Fuel (L) = $\sum (\text{fuel_l_per_km} \times \text{distance_km})$.
- On-time compliance (%) = % deliveries with total time \leq customer max_lead_time_h (teams must state any waiting/handling assumptions; simplest is travel_time_h only).
- Discard rate (%) = spoiled/expired boxes \div dispatched boxes (ambient vs cold shelf life).

Optional supporting metrics: total km, number of dispatches, freshness index.

1) What are we solving? 题目在解决什么？

Vegetable co-op logistics: farms → customers (Peninsular Malaysia) with perishability + cold-chain

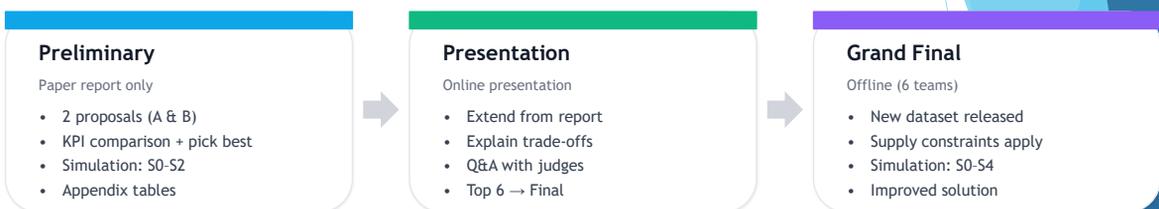


What "better" means 何谓更好？

- You must submit TWO proposals (A & B) and choose the better one with KPIs.
- Hard constraint: 100% demand fulfilment (all scenarios).
- Green focus: Fuel (L) / Fuel Cost + Discard (waste) rate.
- Service focus: on-time compliance within max lead time.
- Transparency: include Route Summary + Delivery Plan in the appendix.

2) Competition stages 三阶段流程

Preliminary (report) → Presentation (online) → Grand Final (6 teams)



Datasets 数据集怎么用？

- Preliminary + Presentation: Dataset_Preliminary_Presentation (supply is NOT limiting; focus on routing + cold-chain + waste).
- Grand Final: Dataset_GrandFinal (capacity constraints apply, but still feasible for 100% demand).
- You can reuse your approach; just adapt to new constraints.

3) What to submit (Preliminary) 初赛要交什么？

Think: Strategy + Evidence + Transparency

Report checklist 报告清单

- Problem understanding (your own words)
- Proposal A (strategy + reasoning)
- Proposal B (different strategy)
- KPI table: A vs B (cost, fuel, on-time, discard)
- Choose “better” proposal + why
- Simulation results: S0–S2
- Assumptions & limitations

Appendices 附录 (必须)

- **Route Summary Table**
 - From / To
 - Distance (km) / Time (h)
 - Tool / Source
- **Delivery Plan Table**
 - Customer / SKU / Boxes
 - Vehicle / Cold-chain
 - Notes

Do & Don't 小提醒

- Do: Keep assumptions explicit and consistent.
- Do: Show how you compute KPIs (traceable).
- Don't: Only write “ideas” without numbers.
- Don't: Hide route sources or skip appendices.

4) Hard constraints & simplifications 规则重点

Hard constraint (must) 必须满足

- 100% demand fulfilment in all scenarios (otherwise invalid).
- Cold-required SKUs must use cold-capable vehicles for delivery legs.

available_days

- available_days = farm dispatch days
- Non-available day = assume no harvest for the co-op
- → no farm storage modelling needed

Spoilage / waste

- Count spoilage ONLY after dispatch
- If not dispatched → treat as not harvested
- → no spoilage counted

5) KPIs we care about 评分核心指标

Fuel-based Green KPI + waste + service level

Minimum KPIs (must report)

- Total Fuel (L) = $\sum (\text{fuel_l_per_km} \times \text{distance_km})$
- Fuel Cost (RM) = Total Fuel \times fuel price
- Total Cost (RM) = $\sum [\text{fixed} + (\text{fuel} \times \text{price} + \text{maintenance}) \times \text{distance}]$
- On-time compliance (%) = on-time deliveries \div total deliveries
- Discard rate (%) = spoiled boxes \div dispatched boxes

What is "Green"?

- Less fuel \rightarrow greener
- Less waste \rightarrow greener
- Distance/trips are optional supporting metrics

Tip for students

- You can do a full solution in Excel.
- Use AI for drafting + checking, not for guessing numbers.
- Always show the calculation trail.

6) Simulation scenarios 情境模拟怎么做？

Preliminary/Presentation: S0–S2; Grand Final: S0–S4

A simple simulation loop (minimum viable)

- For each scenario:
- 1) Adjust demand (and yield if applicable).
- 2) Apply your delivery plan (routes + vehicles).
- 3) Compute KPIs: cost, fuel, on-time, discard.
- 4) Summarise results in a table.

Preliminary dataset

- Supply is NOT limiting.
- Focus on routing and delivery planning.
- Show KPI improvement vs baseline.

Grand Final dataset

- Capacity constraints apply.
- Still feasible for 100% demand.
- Show robustness under shocks.

7) How to make TWO proposals 两个方案怎么做？

Make them meaningfully different, then compare with KPIs

Proposal A (example)

- Direct shipping (farm → customer)
- Simple operations
- May increase distance/fuel
- Potentially better lead time
- Use cold-chain only when needed

Proposal B (example)

- Consolidation (batching / regional delivery)
- Fewer long-haul trips
- Requires planning (multi-stop)
- Risk: longer time → waste
- Cold-chain strategy is key

8) Common pitfalls 常见踩雷点

Avoid these to save time

Checklist

- Missing appendices → KPIs cannot be verified.
- Confusing “not dispatched” with “spoiled”. (We count spoilage only after dispatch.)
- Ignoring available_days dispatch schedule (or modelling farm storage without stating assumptions).
- Cold-required SKU delivered by non-cold vehicle.
- KPI table has numbers but no calculation trail.
- Two proposals are basically the same (no meaningful comparison).

Q&A

Ask anything about constraints, KPIs, or how to structure your report.