

New Zealand



IPWEA

INSTITUTE OF PUBLIC WORKS
ENGINEERING AUSTRALASIA

ROAD INFRASTRUCTURE
MANAGEMENT FORUM

Our Carbon Equation

International Framework, Local Models – the IDS Approach to GHG Modelling

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RIMS

Roading Infrastructure Management Support

in association with

IDS 
Infrastructure
Decision Support

Agenda

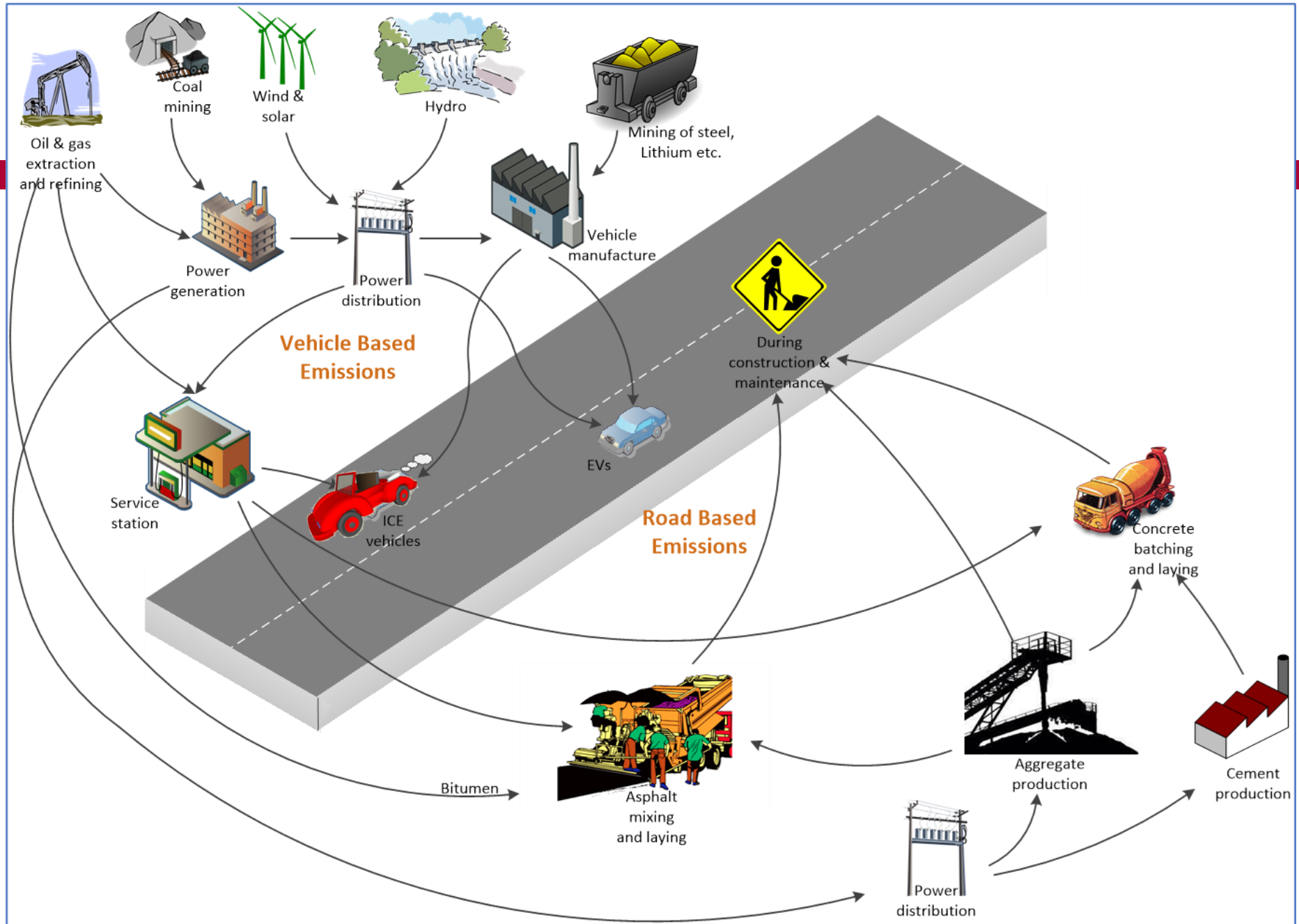
1. International Modelling
2. NZ Models
3. IDS Blending
4. You have an answer, now what?

Objective - A Comprehensive GHG Model

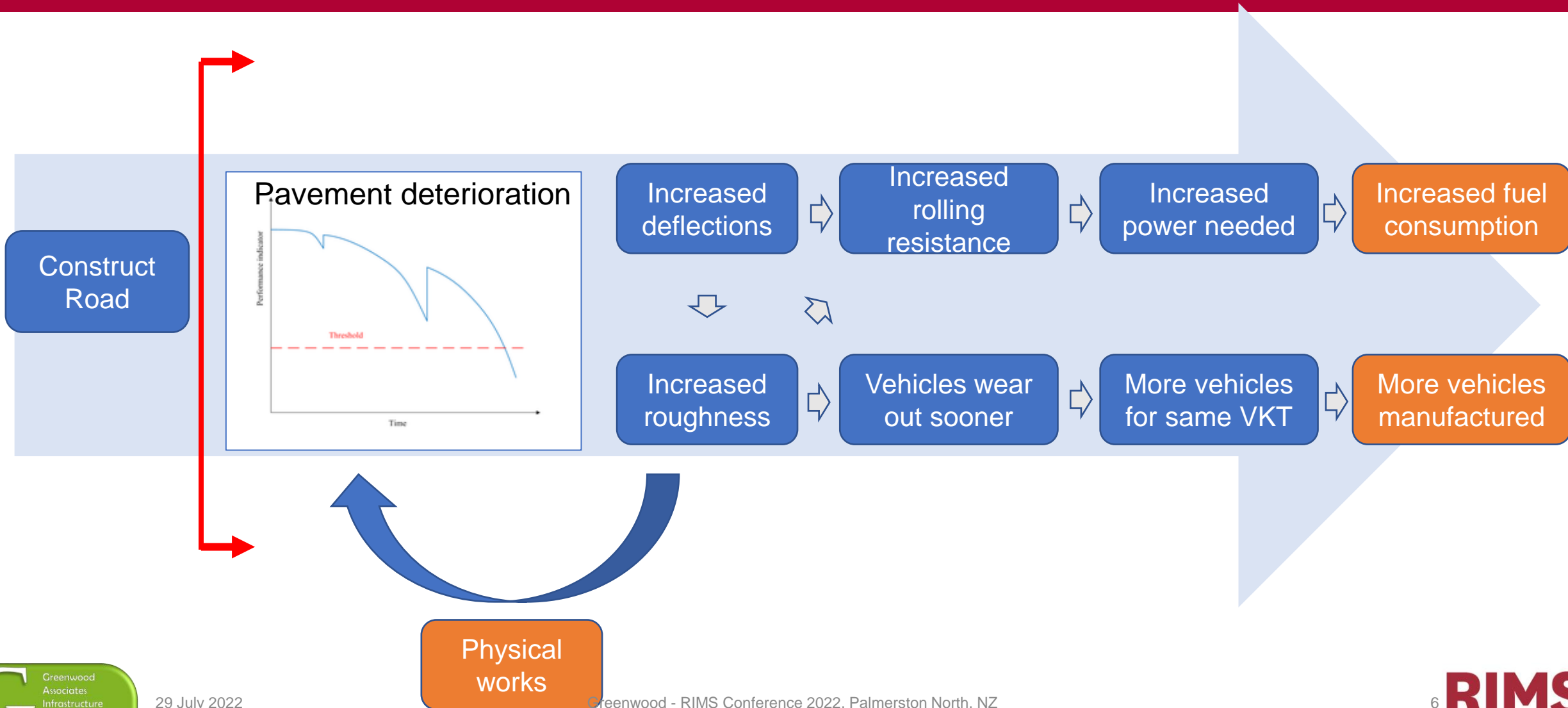
- Has credibility in its predictions of the underlying inputs
 - Alignment with existing NZ industry standards/models where appropriate
- Is sensitive to investment and policy decisions
- Can predict over the short and long term
- Can work at both the project level and strategic level
- Covers the full life-cycle of treatment types (routine maintenance, periodic maintenance, rehabilitation etc.) modelled within the dTIMS setup and associated vehicle emissions
- Can work within the dTIMS modelling framework initially (Oct 2022) for reporting and later (2023) to optimising CO₂

1. International Models

- HDM-4 has predicted vehicle emissions since mid-1990s
 - Works on 1st principles basis – predicting fuel consumption as a function of road and vehicle conditions, then emissions from that.
 - Just no-one bothered to look at the results for 25 years.
- Multilateral Development Banks (MDBs) such as ADB, World Bank and others have committed to not funding projects mis-aligned with Paris Agreement
- MDBs needed a comprehensive emission model that covers full spectrum of emissions
 - Pavement related over full life-cycle of roads
 - Vehicles – including tailpipe, power generation and vehicle manufacturing emissions

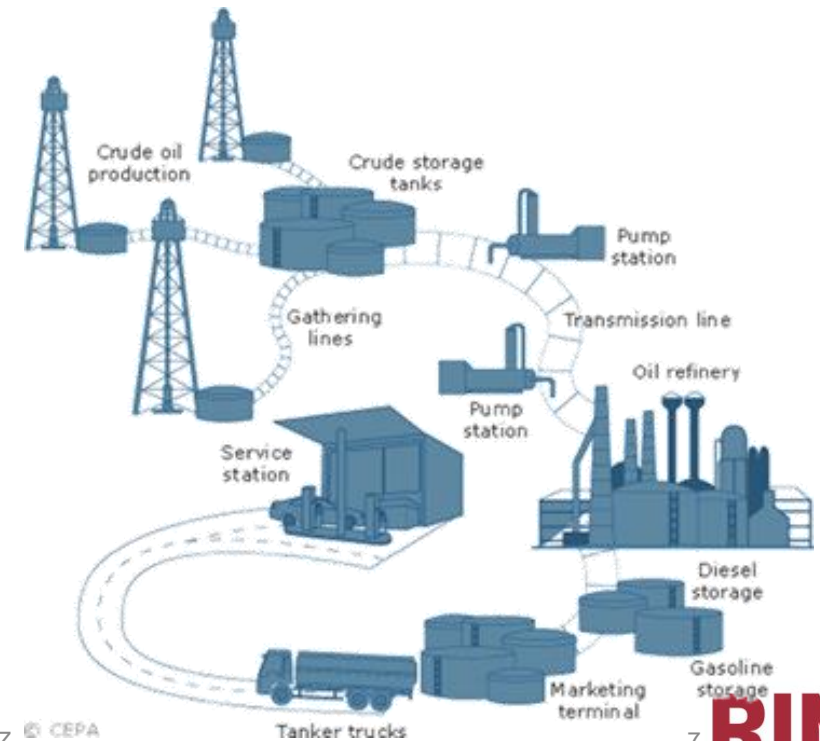


The Conceptual Framework

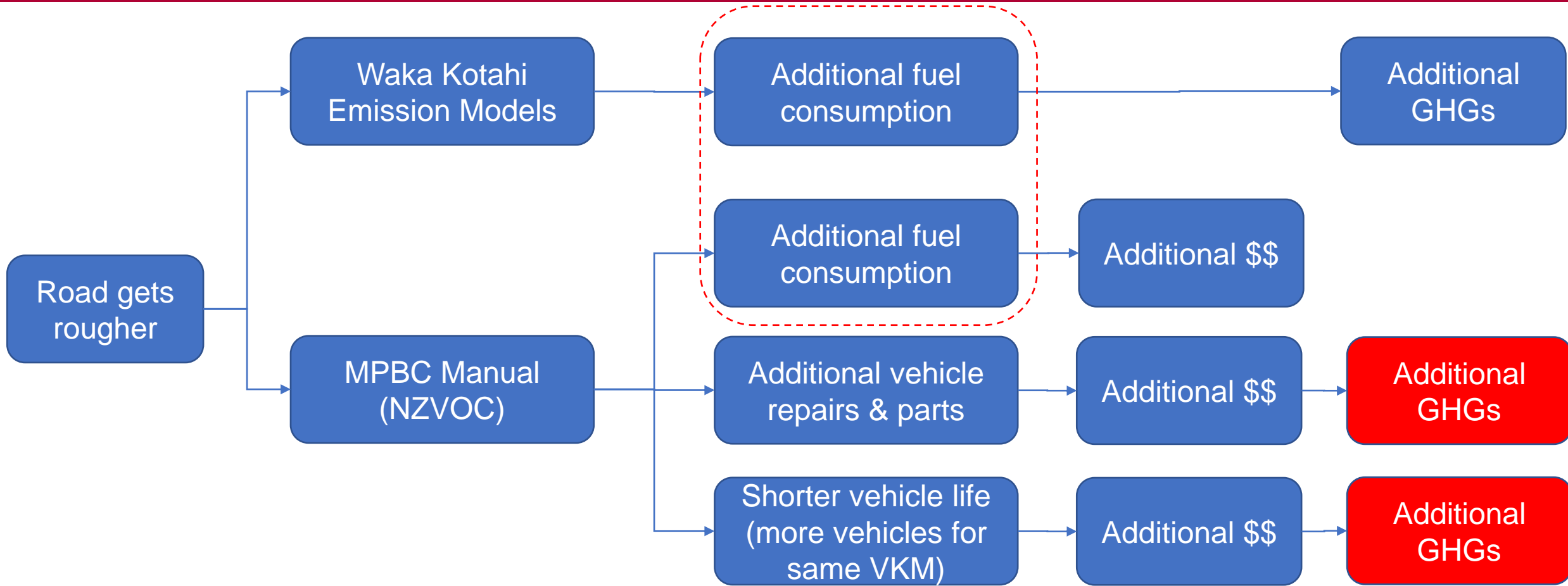


NZ Models

- Waka Kotahi
 - Several models in place already (some in final internal QA stage)
 - Not all fully consistent with other analysis models within Waka Kotahi
 - What Waka Kotahi have to report under govt requirements is not the full scope of emissions
 - Emissions from power plants for EVs is excluded
 - Emissions in producing and transporting fuel to service stations is excluded
 - Emissions from vehicle manufacture excluded
- Industry
 - Many good initiatives



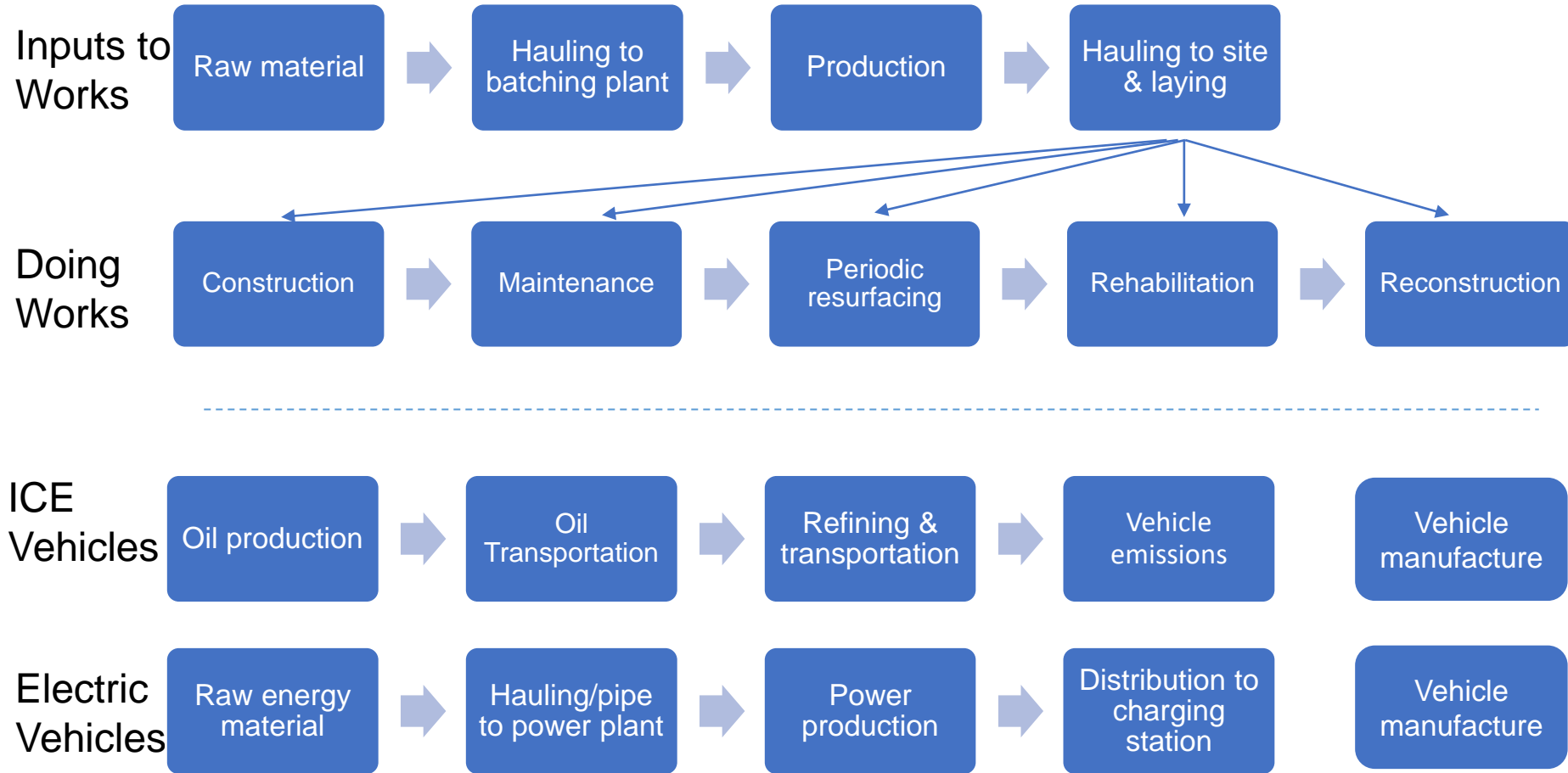
Example of Inconsistency



3. IDS Blending

- Take the structure of the international analysis
- Substitute local component models in as appropriate
 - Reliant on ongoing good will of Waka Kotahi and industry to let NZ benefit from their work to date.
- Fill any gaps with international components
 - No new primary research under this current initiative.
- Ability to report the Waka Kotahi emissions
 - Placeholders for other emissions in case reporting requirements change.

Many Sources

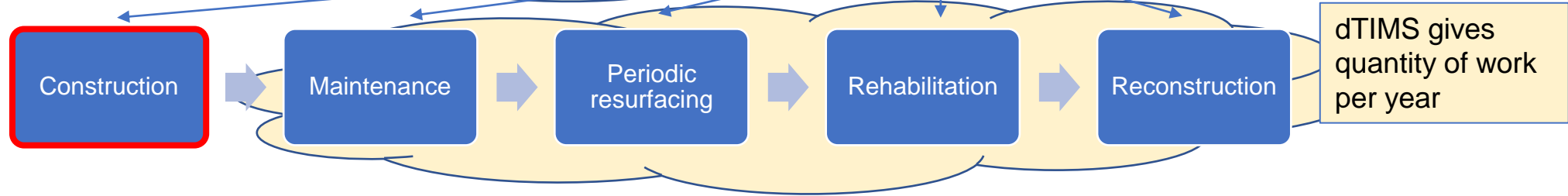


Existing Work

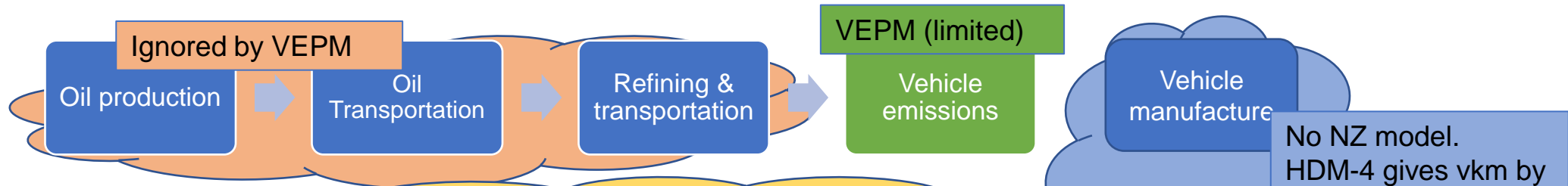
Inputs to Works



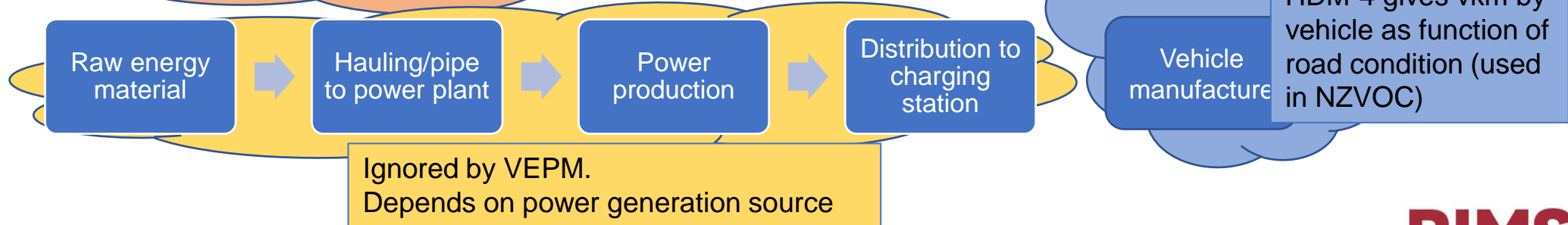
Doing Works



ICE Vehicles



Electric Vehicles



No NZ model.
HDM-4 gives vkm by vehicle as function of road condition (used in NZVOC)

4. You have an answer, now what?

- *Science has promised us truth...It has never promised us either peace or happiness.* Gustave Le Bon
- What to do when your project is a GHG contributor?
- Is GHG minimisation and the “Road to Zero” safety initiative in conflict with each other?
- Should Waka Kotahi (NZ Road Fund) or councils be funding projects that increase GHGs given NZs commitments?

Example Project

- Whangaparaoa Road in Auckland
 - Major arterial road, 30,000+ vpd, circa 5% HCVs
 - 3 lanes with tidal central lane
 - No alternative routes
 - AT propose to install a raised signalised pedestrian crossing in an area of very low pedestrian movements, condemning every vehicle to excessive emissions even in the absence of pedestrians

“we are designing and building a transport system that prioritises safety above all else” - AT

- But, NZ has signed up to Paris Agreement to reduce GHG emissions; NZ govt and Auckland Council have declared Climate Emergencies; AT has asked for additional funding to address Climate Change; and Council has approved a targeted rate for addressing Climate Change.
 - So how does AT make a decision that is misaligned with all these items?
 - Does an aspiration by AT to a target outrank NZ’s legally binding international commitments on GHGs?

MDB Approach – Paris Alignment

- Some projects are universally aligned
 - Eg Maintenance and renewal of existing transport infrastructure
- Some projects are universally misaligned
 - Eg Building a coal power station
- Rest go through a screening process
 - If any misalignment, they don't get funding.

Specific Assessment Criteria Considering National / Sectorial Circumstances

UC1

UC1

UC1

Is the
list' with

UC1

Is
PA c

Specific

NON-A



PROJECT/ECONOMIC ACTIVITY CHECKLIST



SC1

Is it inconsistent with the NDC of the country in which it takes place?



SC2

Is it inconsistent with national economy-wide/sectoral/regional low-GHG strategy that is compatible with the goals of PA over its life time?



SC3

Is it inconsistent with sector specific PA criteria considering differentiated responsibilities and capabilities of countries?



SC4

Does it prevent opportunities to transition to the PA aligned activities OR support misaligned activities in a specific country/sectoral context?



SC5

Is it unviable taking into account stranded asset/transition risks in the national/sectoral context?



If at least one YES

NON-ALIGNED



If NO to all

ALIGNED

Question for NZ

- Once we have the knowledge, what will we do with it?
- Do we invest in mis-aligned projects if they offer significant other benefits?
- Do we need a NZ investment screening process to help ensure we meet our international commitments and to avoid unwittingly (or not) making things worse?

Summary

- The easy part
 - IDS is working with Waka Kotahi to build a GHG model
- The hard part
 - What do we do with the answer?
 - Do we 'walk the talk' and put our money where our green mouth is?

Thank you

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