

He aha te rahi o te ngāherehere e
hiahiatia ana ki te whakataurite i
te whakamahana e puta ana i te
mewaro ahuwhehenua?

Tuhinga whakarāpopoto

Oketopa 2022



Ka taea tēnei tuinga te tārua ina whakaatuhia te mātāpuna. E wātea ana tēnei tānga me ētahi atu tānga hoki nā Te Kaitiaki Taiao a Te Whare Pāremata ki pce.parliament.nz.

Te Kaitiaki Taiao a Te Whare Pāremata

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Oketopa 2022

Nā Basil Keane i whakamāori.

Atahanga uhi: Sorajack, iStock.

He aha te rahi o te ngāherehere e hiahiatia ana ki te whakataurite i te whakamahana e puta ana i te mewaro ahuwahenua?

Tuhinga whakarāpopoto

Oketopa 2022

Nā Simon Upton

Te Kaitiaki Taiao a Te Whare Pāremata

He aha te Kaitiaki Taiao a Te Whare Pāremata i tuhi ai i te kupu tīpoka?



I whakatinanahia ngā whāinga whakaheke putanga mō 2050 ki te ture i te tau 2019. Ki a au nei, kāore i tino whakamāramahia te pūtake o te whāinga more mō ngā haurehu kati mahana wā roa me te whāinga tōpūtanga mō te mewaro pūkoiora. He aha te take ka whai wāhi ai te hunga whakaputa hauhā i roto i te ohaoha pūtake kora ki te ratonga whakataurite ngāherehere e herea ana hei āwhina i a rātou ki te whakatutuki i tō rātou whāinga whakaheke putanga, engari kāore e whai wāhi ai te hunga whakaputa mewaro kararehe pāmu i roto i te ohaoha pūtake whenua?

Ka unu ngā ngāherehere i te hauhā i te kōhauhau, kua ko te mewaro. Engari, mēnā ko te tikanga o te whakataurite ngāherehere ko te auaha i te whakaaweawe whakamakariri hei utu paremata i te whakamahana e puta mai ana i ngā putanga nō wāhi kē, tērā pea ka taea – ā-ariā nei – te whakamahi i te ngāherehere ki te whakataurite i te whakamahana nō tētahi haurehu kati mahana. Ka tāpirihia te mewaro pūkoiora i whakaputaina ai i ngā mātāpuna tipu, kararehe rānei.

I tuku kirimana au ki a Professor Dave Frame rāua ko Dr Nathanael Melia kia tātai he aha te horahanga o te ngāherehere e hiahiatia ana ki te whakataurite i ngā putanga mewaro kararehe pāmu me te whakamahi i te ahunga pūtake whakamahana.¹ E whakahuatia ana ā rāua hua me ētahi tauira whakamahi i te taumata ā-motu i roto i te kupu tīpoka.

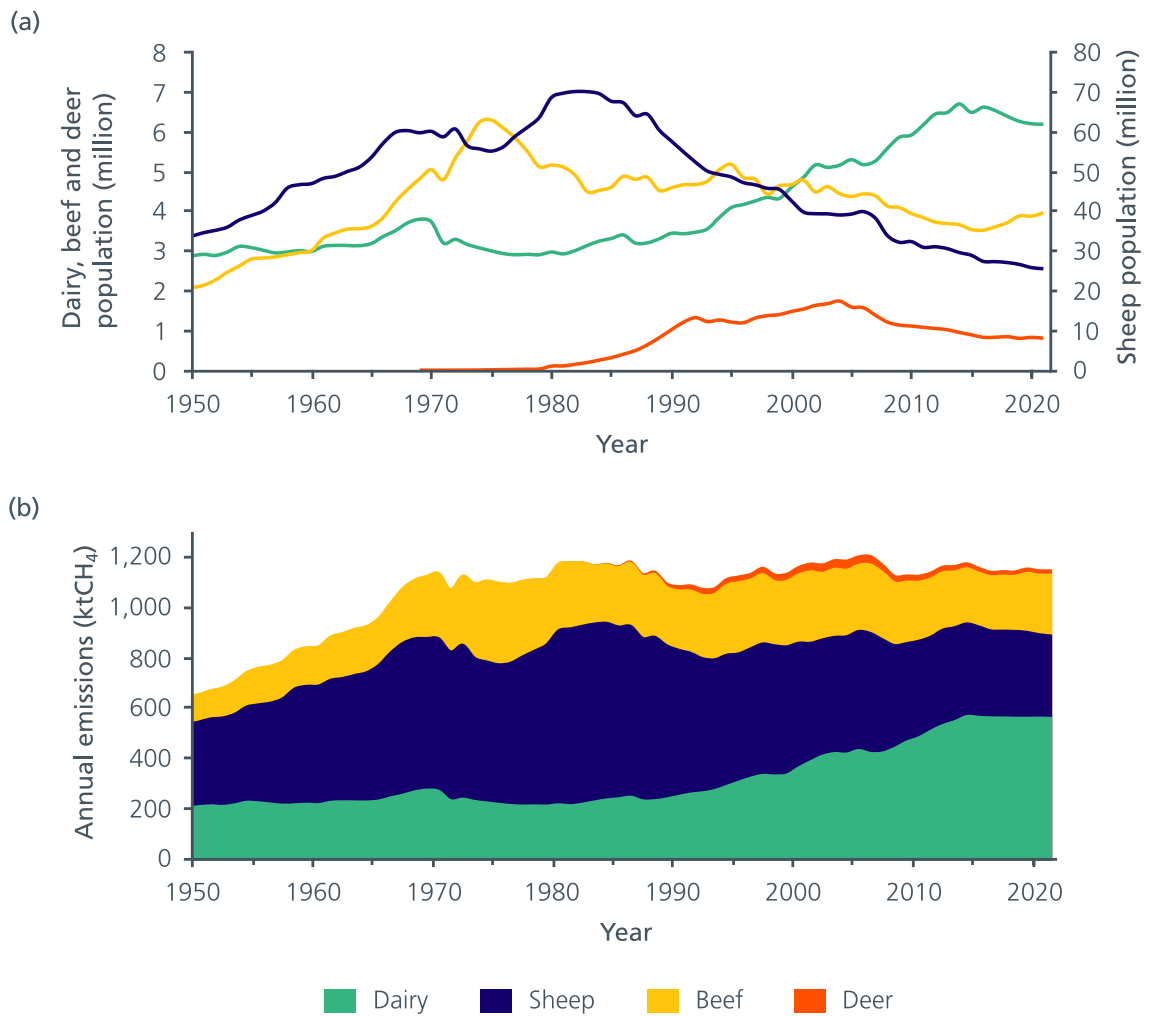
Kāore he tūtohu i roto i te kupu tīpoka. Ko te whāinga o taku tānga i tēnei, he whakatakoto noa i ngā mea e taea ana te whakapae tika, me ngā mea kāore e taea, e pā ana ki te whakataurite i te mewaro nō te kararehe pāmu. Ko te tūmanako ka tautoko i te taupatupatu whaimōhio pai ake mēnā ka arotakehia te whāinga o Aotearoa mō 2050 e pā ana ki te mewaro pūkoiora ā muri ake.

¹ Frame rāua ko Melia, 2022. E wātea ana tētahi tārua o tēnei pūrongo i runga i te pae tukutuku a PCE, pce.parliament.nz.

E hia te mewaro e whakaputaina ana e ngā kararehe pāmu i Aotearoa?

E whakaputa ana ngā kāhui kararehe pāmu i te 1.2 miriona tana mewaro i ia tau. E 91 ōrau o ngā putanga mewaro pūkoiora, ā, e 89 ōrau o ngā putanga mewaro katoa e puta mai ana i ngā kararehe pāmu.

I roto i ngā tekau tau e rua kua pahure, kua piki ngā putanga mewaro i te kau miraka, engari kua heke ngā putanga i ngā hipi, te kikokau me te tia. Ko te hua more kua āhua ōrite ngā putanga mewaro kararehe pāmu katoa mai i te tau 2000.



Hoahoa 1: Te nama o ngā kararehe pāmu (a) me ngā putanga mewaro kararehe pāmu (b) i waenga i te tau 1950 me te tau 2021. Ka tīmata ngā tūtohi i te tau 1950, nā te mea koinei te tau tuatahi kua wehewehea ngā tauanga mō te kau miraka me te kau kikokau.

He aha te rahi o te whakamahanatanga e puta ana i ngā putanga mewaro kararehe pāmu o Aotearoa?

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He nui rawa te pōkaikaha e pā ana ki te rahi o te whakamahanatanga e puta ana i ngā putanga mewaro o ngā kararehe pāmu o Aotearoa. Ka kitea tēnei āhuetanga nō roto i te hunga e tonono ana kia kaha ake te whakapoto i ngā putanga mewaro pūkoiora, nō roto hoki i te hunga e taunaki ana i te whakaaro tauaro, nā runga i te whakaaro kāore he take kia āwangawanga mātou ki te mewaro mēnā e tūwhena ana tōna tāpaetanga.

Kāore e taea te whakahē he kaha, engari he wā poto te whakaaweawe o te putanga wā kotahi o te mewaro ki te āhuarangi ina whakatairitea ai ki te hauhā. Ahakoa ko te nuinga o te whakamahana ka puta i roto i ngā tekau tau ruarua tuatahi i muri i te putanga kotahi anake, tērā hoki tētahi whiore iti mō te wā roa o te whakamahanatanga tonutanga.

Ka whakaputaina e ngā kāhui ruaruaki puku maha katoa – ahakoa he ōrite te rahi o te kāhui, e heke ana te rahi rānei – te mewaro. Mā ēnei putanga mewaro e haere tonu ana e mahana ake ai te ao, ā, kāore e pērā ki te kore taua kāhui. Ā tōna wā ka whakatūwhena te whakamahana nō te kāhui o te rahi pūmau (i muri i neke atu i te rautau). Engari ko te tāpaetanga whakamahana tūwhena o tētahi kāhui, he kāhui e whakamahana tonu ana i te ao.

Nā ngā putanga mewaro onāiane nō ngā kararehe pāmu o Aotearoa i 0.0015 °C te mahana ake i tō te korenga o ā mātou kāhui ruaruaki puku maha. I ētahi wā ka kīia tēnei he whakamahana taitapa.

Hei whakatauritea, ko ngā putanga hauhā mātātoka me ngā putanga hauota-rua ōkai mai i te tau 1850 e whakapiki ana i te paemahana o te ao ināiane mā te 0.0009 °C, ā, tata ki te 0.0004 °C. (He iti rawa atu ēnei tāpaetanga whakamahana ki te whakaaweawe whakamahana haere tonu i te topetopehanga o ngā ngāherehere taketake matua nō mua, nā reira i whakaputa ai i ngā rōrahi nui rawa o te hauhā ki te kōhauhau.) Nā reira, nā te mewaro kararehe pāmu i puta te 55 ōrau o te tāpaetanga whakamahana onāiane o Aotearoa nō te putanga nō mua o te hauhā mātātoka, te hauota-rua ōkai ahuhenua me te mewaro kararehe pāmu mai i te tau 1850 (hāunga te whakaaweawe o te tuangahere ā-hītori).

Nā te mea he āhua tere te heke o te mewaro i roto i te kōhauhau, tata ki te katoa o te mewaro i whakaputaina ai i mua i te tau 1990 kua ngaro. Ko te nuinga o te whakamahana i ēnei rā nō te mewaro kararehe pāmu, ka puta mai i muri iho i te tau 1990. Hei whakatauarotanga, e tata ana ki te haurua o te whakamahana onāiane nō ngā putanga hauhā mātātoka he whakaaweawe tuku iho o te hauhā i whakaputaina ai i mua i te tau 1990.

E hia te whakamahana kua rakaina kētia nā ngā putanga o mua?

Ahakoia pēhea te whakaitinga o ngā putanga anamata, 'kua rakaina' kētia ētahi whakamahana hei tukunga iho nō ngā putanga o mua.

E hia ngā rautau kei mua i a tātou ka mahana ake te ao i ngā putanga hauhā mātātoka o mua i tō te noho tonu o tēnei waro ki ngā kurawai mātātoka, ā, kāore i tukuna kētia ki te kōhauhau.

Hei whakatauarotanga, nā te mea he iti te ora o te mewaro, ka ngaro ā te tau 2050 te nuinga o te mewaro i whakaputaina i mua i te tau 2020. Engari, mēnā tērā ētahi kāhui kararehe pāmu e tokopuaha ana i te mewaro, ka toitū tētahi taumata whakamahana haere ake nei. Nā reira, ko te nui o te whakamahana e puta mai ana i ēnei kāhui i te wāhanga tuarua o tēnei rautau ka hāngai ki ngā mahi e mahia ana, kāore e mahia ana rānei, ki te whakaiti i ngā putanga mewaro kararehe pāmu mai ināianei, ā, tae atu ki te tau 2050.

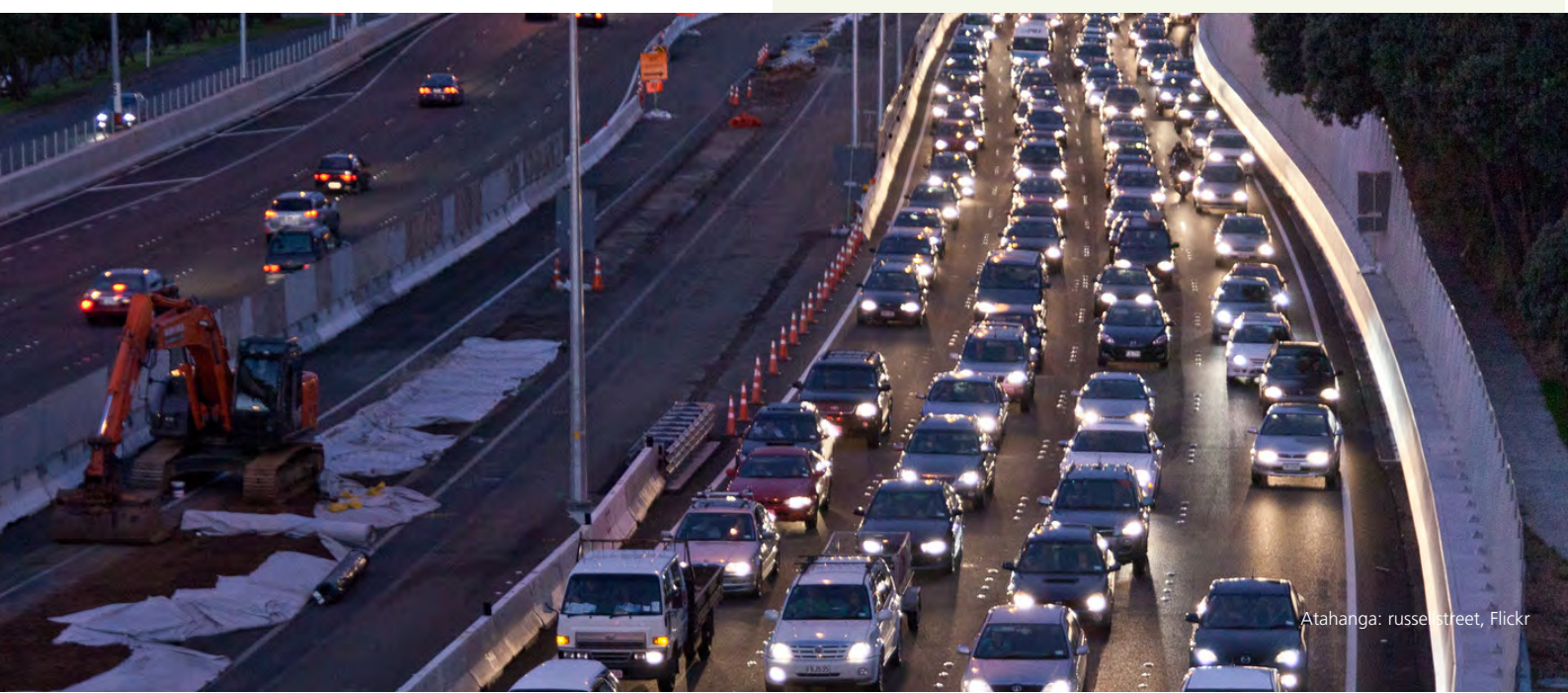
He aha te whakamahana tāpiri?

Ka puta mai te pōkaikaha nā te mea e whakamahia ana te kupu 'whakamahana' i ētahi wā ki te kōrero mō te panoni o te whakamahanatanga e pā ana ki te taumata tohutoro, pērā i te taumata o 1990. Mēnā kua piki te whakamahanatanga mai i te taumata tohutoro, he 'whakamahana tāpiri' e pā ana ki te taumata tohutoro.

He tino rerekē te panoni o te whakamahana e pā ana ki te taumata tohutoro e hāngai ana ki te taumata tohutoro e whakamahia ana. Hei taurira, ko te whakamahana tāpiri nō ngā putanga mewaro kararehe pāmu onāianei e tata ana ki te 0.0015 °C e pā ana ki te taumata o 1850, e tata ana ki te 0.0007 °C e pā ana ki te taumata o 1950, ā, e tata ana ki te 0.0002 °C e pā ana ki te taumata o 1990.

Nā reira, he mea hira kia kōrerotia te taumata tohutoro ina whakamahia ana te kupu 'whakamahana tāpiri'. Hei tāpiri ki *tēhea taumata?*

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Ki te whakaiti i ngā putanga mewaro kararehe pāmu, ka puta mai te whakamakariritanga?

Ko te whakautu poto e pēnei ana, kei te tikanga o tō whakamāramatanga o te kupu whakamakariritanga.

E rite ana te kāhui kararehe pāmu ki te hatete i roto i te rūma. Mēnā ka whakakāngia, ā, ka waiho ki te whakaritenga ōrite, ka whakatūwhena te paemahana o te rūma ā tōna wā ki te taumata teitei ake.

Ina whakatūwhenatia te paemahana o te rūma, e whakamahana tonu ana te hatete – arā, ka noho te paemahana o te rūma ki te taumata teitei ake i tō te paemahana mēnā kua wetohia te hatete.

Mēnā ka whakahekea te hatete ki te whakaritenga iti iho, ka heke iho te paemahana o te rūma. He makariri iho te rūma ināianei i tō te wā i mua i te whakaitinga o te wera o te hatete. Engari e whakamahana tonu ana te hatete, nā te mea he mahana ake te rūma i tō te korenga o te hatete.

Mō ngā take o tēnei kupu tīpoka, ko te reo i whakamahia ai mā te whakaiti i te nama o ngā kararehe pāmu, e whakaiti ai te taumata o te whakamahana e hāngai ana ki taua kāhui.

He aha te whakaitinga o te whakamahana e taea ai mā te whakaheke i ngā putanga anamata?

Ehara te taumata whakamahana e whakapau kaha ana a Aotearoa ki te parahau mō āna putanga o te mewaro pūkoiora me ngā haurehu kati mahana wā roa i te kaupapa ā-pūtaiao, engari he kōwhiringa ā-oaha, ā, pāpori, ā-tōrangapū anō hoki. Kua whakaturea e te Pāremata ētahi whāinga kia whakaiti i ngā putanga mewaro pūkoiora ki te 10 ōrau hei te tau 2030, ā, 24-47 ōrau hei te 2050 e pā ana ki te taumata nō 2017. Ina whakaitia ngā putanga mewaro kararehe pāmu i waenganui i te 24-47 ōrau hei te 2050, ka whakaitia āna tāpaetanga ki te whakamahana kia heke i raro i te taumata onāianehei hei te wāhanga tuarua o tēnei rautau.

Ka āta whakaritea te tāpaetanga o Aotearoa ki te whakamahana nō ngā putanga anamata mā ngā 'mataine' e whā e whāi ake nei:

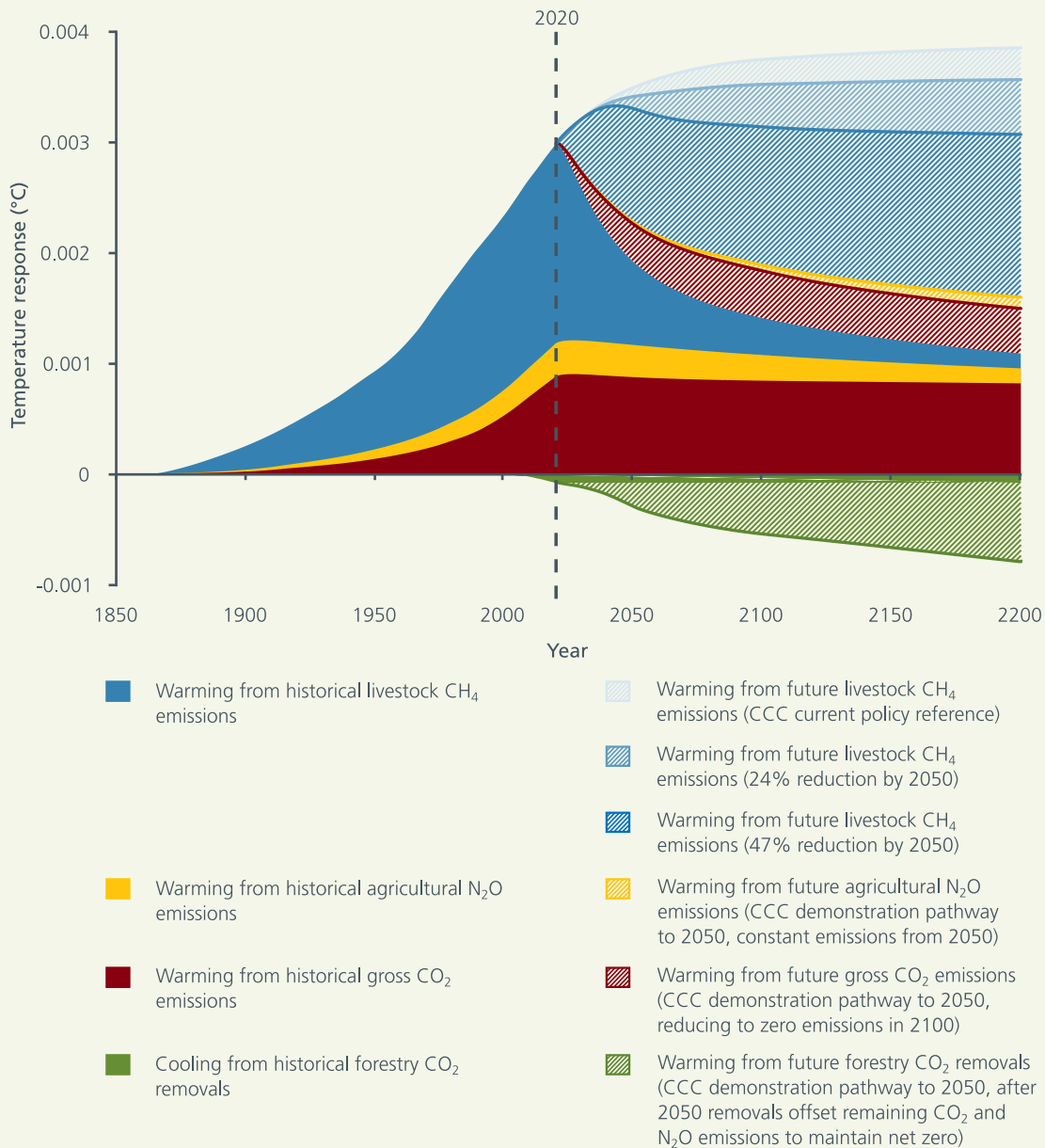
- Ngā putanga ā-tau anamata o te mewaro kararehe pāmu. Ki te whakaiti i ngā putanga ā-tau anamata, ka whakaitia te whakamahana nō tēnei mātāpuna i roto i ngā tekau tau torutoru.
- Ko ngā putanga hauhā mātātoka tāpiripiri. Ka piki ake tonu te whakamahana nō ngā putanga hauhā mātātoka ki te kore e whakaitia ngā putanga ā-tau kia eke ki te kore.
- Ko ngā putanga hauota-rua ōkai ahuhenua tāpiripiri. E pērā ana ki te hauhā mātātoka, ka piki ake tonu te whakamahana nō ngā putanga hauota-rua ōkai mēnā e nui ake ana ngā putanga ā-tau i te kore.
- Ko te whakamahi o ngā whakatauritenga pērā i te unuhia o te hauhā e ngā ngāherehere. Ka taea e ngā whakatauritenga te noho hei utu paremata mō ētahi, te katoa rānei o te whakamahana e puta mai ana i te (a), te (b) me te (c). Heoi anō, tērā ētahi tepenga me ngā tūraru e pā ana ki ā rātou whakamahi.

Me whakamahi te katoa o ngā mataine e whā kia whakatutuki a Aotearoa i ana herenga whakamauru panoni āhuarangi i raro i te Whakaaetanga o Pārihi. I tua atu i te whakaiti i ngā putanga hauhā, hauota-rua ōkai hoki, ki te whakaiti i ngā putanga mewaro kararehe pāmu ka tino whakaiti i te tāpaetanga ki te whakamahana e puta ana i ngā putanga anamata o Aotearoa.

I roto i te 'huarahi whakaatu' a te Kōmihana Panoni Āhuarangi, ka whakaitia ngā putanga hauhā tōpūtanga me ngā putanga hauota-rua ōkai tōpūtanga mā te 78 ōrau me te 28 ōrau hei te 2050, e hāngai ana ki te taumata o 2019.

Ki te whai ngā putanga hauhā me ngā putanga hauota-rua ōkai i tēnei huarahi, ā, ka whakaitia ngā putanga mewaro kararehe pāmu mā te 47 ōrau hei te tau 2050, ā, ka noho tonu ki tēnei taumata, ka noho te whakamahana nō te mewaro kararehe pāmu e whakaputaina ana i te tau 2020, ā, haere ake nei, hei pūtake mō tata ki te toru hautoru o te whakamahana nō ngā putanga anamata katoa hei te mutunga o te rautau.

Mā te whakaiti i ngā putanga mewaro kararehe pāmu e puta mai ai he pāpātanga tūturu ā-oaha, ā-pāpori hoki ki te iwi me ngā āhuetanga o ō rātou nā ao. Me āta whakarite i te hangarite i waenganui i te aronga ki te pakokinga ā-oaha, ā-pāpori hoki me te kite i te tūnga e taea ana e Aotearoa te wawao i roto i ngā whiriwhiringa panoni āhuarangi ā-ao, me te whakataetae tonu i roto i ngā māketete kai ā-ao e piki ana te popono kiritaki ki ngā otinga putanga iti.



Hoahoa 2: Ko te whakamahana nō ngā putanga o mua me ngā huarahi whakatauirā mō ngā putanga anamata. E whakaatu ana ngā takiwā kauruku totoka i te whakamahanatanga nō ngā putanga o mua – kua 'rakaina' kētia tēnei whakamahanatanga. E whakaatu ana ngā takiwā kauruku whakarārangi i te whakamahanatanga nō ngā putanga anamata ka taea pea te karo mā te whakaiti i ngā putanga. Ka hiahiatia ngā whakaitinga hōhonu, tere, toitū hoki o ngā putanga tōpūtanga o te mewaro kararehe pāmu, te hauhā mātātoka me te hauota-rua ōkai ahuhenua – me ngā unuhanga hauhā whakarākei hoki i ngā ngāherehere – kia whakaiti i te whakamahanatanga nō ngā putanga anamata o Aotearoa.

Me pēhea e whakaiti i ngā putanga mewaro kararehe pāmu?

Ka taea e ngā kaipāmu te whakaiti i ngā putanga mewaro kararehe pāmu mā te whakaiti i ngā nama o ngā kararehe pāmu ina unu ana i ētahi o ngā kararehe pāmu, ina panoni ana rānei i te whakamahi whenua mai i te ahuhenua tītongi otaota ki ētahi atu whakamahinga whenua pērā i te ahumāra, i te ngāherehere rānei. I tua atu i tēnei, he iti rawa ngā kōwhiringa e wātea ana i te ao arumoni ki te nuinga o ngā kaipāmu ki te whakatutuki he mea atu i ngā whakaitinga tāpiri ki ngā putanga mewaro kararehe pāmu.

E rangahau ana ngā hangarau e taea ai te whakaiti i ngā putanga mewaro kararehe pāmu nō ngā pāmu, pērā i ngā hipi me ngā kau mewaro iti, ngā kai mewaro iti, ngā tāmoe mewaro me te rongoā āraimate mewaro. Me noho te whakahohoro i te tere o tēnei rangahau hei whakaarotau mātāmua mō Aotearoa.



Ko te aha te tūnga o ngā whakataurite ngāherehere?

Ko te take o te whakataurite kia whakangāwari i ngā tukunga iho kino ā-pāpori, ā-ahurea, ā-oahaoha anō hoki o te whakatutuki i ngā whāinga whakaheke putanga tōpūtanga. Mā tēnei e taea ai te whakarite me te whakatutuki i ngā whāinga whakaheke putanga awhero ake.

Nā te hiahia ki ngā whakaitinga hōhonu i roto i ngā putanga katoa, me noho te whakataurite mā ngā rākau hei kōwhiringa whakamutunga e whakamahia ana mēnā kua pau katoa ngā tikanga whai kiko hei whakaiti i ngā putanga ki ngā mātāpuna.

Mēnā ka whakamahia te ngāherehere ki te whakataurite i te mewaro kararehe pāmu, me whakamahi hei tāpirihanga ki ngā whakaitinga putanga tōpūtanga, kua kē hei whakakapinga.

Ka whakaturea e te Climate Change Response Act 2002 kia whakaitia mā te 24–47 ōrau ngā putanga mewaro pūkoiora hei te tau 2050 e pā ana ki te taumata 2017. Ka āhei ngā whakataurite ngāherehere te whakamahi kia tae ki tua atu i te whakaitinga tōpūtanga mōkito i roto i tēnei whānuitanga e taea ai.

I raro i te hanganga onāiane i te Climate Change Response Act kāore i te whakaaetia te tatau i ngā whakataurite ngāherehere ki ngā whāinga ā-motu mō te mewaro pūkoiora. Nā reira, me panoni te hanganga o te Ture ina whakaarohia ana te mahi pēnei.

He aha te rahi o te ngāherehere me whakatō hei whakataurite i ngā putanga mewaro kararehe pāmu?

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Ko te horahanga o te ngāherehere e hiahiatia ana hei whakataurite i ngā putanga mewaro i te kāhui kararehe pāmu e hāngai ana ki te tikanga e whakamahia ana ki te tautuhi i te ōritetanga i waenganui i te unuhia o te hauhā e ngā ngāherehere me ngā putanga mewaro e puta mai ana i ngā kāhui kararehe pāmu.

Ko te ahunga auraki nō te GWP₁₀₀

Ka noho te inenga 100-tau pitomata whakamahana ā-ao (GWP₁₀₀) hei pūtake o te ahunga auraki ki te mahi kaute haurehu kati mahana. Ka huri tēnei ahunga i ngā rahinga o ngā haurehu kati mahana rerekē ki tētahi waetahi pātahi e kīia ana ko 'ngā tana o te ōritetanga hauhā', e taea ai te tāpiri me te tango. Ko tōna pūtake ko te nuinga o te wera ka whakaheia ā-toharite i roto i te wā 100-tau ina whakatauritea ki te kotahi tana o te hauhā.

Mā te ahunga auraki, ka whakatauritea ngā putanga ā-tau o te mewaro kararehe pāmu (i roto i ngā tana o te ōritetanga hauhā) i ia tau e te rahi ōrite o ngā unuhanga ā-tau o te hauhā nā te ngāherehere (i roto i ngā tana o te hauhā). Ka waihanga te ngāherehere whakatō paina hou i ngā unuhanga ā-tau i roto i tana huringa tuatahi, tae noa ki tana tāka waro toharite wā roa. Ka ekengia tēnei i muri i te 16 tau mō te ngāherehere *Pinus radiata* i runga i te huringa 28-tau.

Kia whakatūturu i te rerenga rawaka o ngā unuhanga hauhā ā-tau, e marohi ana tēnei ahunga me whakatō i te takiwā iti o te ngāherehere whakatō paina hou (ko tōna 0.1 heketea mō ia kau mō te kāhui miraka) i te tuatahi. I muri i te 16 tau, ka eke te ngāherehere ki tōna tāka waro toharite wā roa, ā, me whakatō anō i te 0.1 heketea o te ngāherehere hou mō ia kau ki wāhi kē. Ka whāia anōtia tēnei e te 0.1 heketea mō ia kau hei te tau 32, he 0.1 heketea anō mō ia kau hei te tau 48, ā, haere ake nei.

Ka taea te hauhake me te whakatō anō i ia ngāherehere whakatō paina hou, engari me noho tonu hei whenua ngāherehere mō āke tonu atu, me whakatō rānei i te horahanga ōrite o te ngāherehere ki wāhi kē mēnā ka tuangaheretia te whenua ngāherehere taketake.

Ka āhua whakataurite tēnei i te whakamahana me te whakamakariri toharite mō te wā o te 200 tau. Engari, kāore e whakatūturuhia ana ka whakatauritea e te whakamakariri nō te whakatō ngāherehere te utu paremata mō te whakamahana nō te kāhui i ngā wā katoa.

I roto i te rautau tuatahi, he iti rawa te whakaaweawe whakamakariri o te whakatō ngāherehere hei utu paremata mō te whakaaweawe whakamahana o ngā putanga mewaro. I roto i te rautau tuarua, ina whakatōngia ai ētahi atu ngāherehere, ka hoki whakamuri tēnei, ā, ka nui ake te whakaaweawe o te whakatō ngāherehere i te whakaaweawe whakamahana o ngā putanga mewaro.

He ahunga pūtake whakamahana nō te GWP*

I te mahira au kia mōhio mēnā ka āhei te whakawhanake i te ahunga pūtake whakamahana ki te whakataurite i te mewaro nā ngā rākau e karo ai i te utu paremata nui rawa, iti rawa rānei i te hipatanga o te wā mō te whakaaweawe whakamahana o ngā putanga mewaro toitū nō te kāhui kararehe pāmu. Nā reira, ka tuku kirimana au ki a Frame rāua ko Melia ki te tātai he aha te horahanga o te ngāherehere e hiahiatia ana kia whakatutuki i tēnei.

Ko te tikanga i whakawhanaketia e rāua he mea whakamahi i te inenga haurehu kati mahana e kīia ana ko te GWP*. Ka whakawhanaketia te inenga GWP* hei whakaata tika i te mahi panoni a ngā putanga mewaro toitū i te paemahana toharite ā-ao i te hipatanga o te wā. Ka whakatūturu te ahunga pūtake whakamahana ki te whakataurite i te mewaro kararehe pāmu mā ngā rākau e hāngai ana ki te GWP* he āhua ōrite te whakaaweawe paemahana o te whakataurite i ngā wā katoa ki te whakaheke i ngā putanga i te mātāpuna.

Mā te whakamahi i tēnei tikanga, ko te whakatau tata a Frame rāua ko Melia ko te horahanga o te ngāherehere whakatō paina hou me te wā o te whakatō e hiahiatia ana ki te whakatutuki i te whakaaweawe paemahana āhua ōrite i te hipatanga o te wā ki te tango i te kararehe kotahi i te kāhui. Ko ngā hua matua, ka hiahiatia te whakatō i te tīmatanga kia 0.6 heketea mō ia kararehe mō te kau miraka, kia 0.4 heketea mō ia kararehe mō te kau kikokau, kia 0.2 heketea mō ia kararehe mō te tia, ā, kia 0.08 heketea mō ia kararehe mō te hipi.

Ka taea te horahanga hou o te ngāherehere whakatō paina te hauhake me te whakatō anō. Ka whakapae ēnei tātai i te huringa 30-tau. He iti iho te horahanga o te ngāherehere mēnā ka whakatōngia te ngāherehere ki te rohe e tere ake ana te pāpātanga tipuranga toharite, e roa ake ana rānei te roanga o te huringa i te 30 tau.

Te whakataurite i ngā ahunga e rua

I roto i te wā 100-tau, he āhua ōrite te horahanga tapeke o te ngāherehere whakatō paina e hiahiatia ana kia whakatōngia hei whakataurite i te rerenga tonutanga o ngā putanga mewaro kararehe pāmu ina whakamahia ai te ahunga auraki, te ahunga pūtake whakamahana rānei. Ko te tino rerekētanga i waenganui i aua mea e rua ko te wā o te whakatōngia.

Mēnā e whakamahia ana te ahunga pūtake whakamahana me te GWP*, e āhua rima whakarea ki te ono whakarea nui ake te horahanga o te ngāherehere whakatō paina hou e hiahiatia ana kia whakatōngia ai i te tuatahi i tō te horahanga e hiahiatia ana mā te whakamahi i te ahunga auraki nō te GWP₁₀₀.

Nā reira, ka whakaputaina wawetia e te ahunga pūtake whakamahana te whakamau panoni āhuarangi, kua ko tētahi wā hei tērā rautau. He ita te horahanga e hiahiatia ana i raro i te ahunga pūtake whakamahana, ā, kāore he herenga kia whakarahi ake te horahanga ngāherehere i muri i te whakatōngia tuatahi.

Hei whakatauarotanga, ka tohatohaina ōritehia te whakatōngia i roto i te wā 100-tau mō te ahunga auraki. Engari ā muri ake i te 100 tau, ka whakamakoha tonu te horahanga o te ngāherehere e hiahiatia ana i ia 16 tau ina rere tonu ana ngā putanga mewaro kararehe pāmu.

Kāore te whakamahi i te ahunga pūtake whakamahana hei whakataurite i te mewaro kararehe pāmu e raka pūmau ai te whenua mō āke tonu pērā i te whakataurite i te hauhā mātātoka. Mēnā ka heke te rerenga o ngā putanga mewaro kararehe pāmu e whakatauritehia ana ā muri ake, ka taea te whakamahi i te whenua ngāherehere mō tētahi atu mahi.

E hia te ngāherehere e hiahiatia ana ki te whakataurite i ngā putanga mewaro kararehe pāmu ā-motu o Aotearoa?

Ka hāngai te whakautu ki tēnei pātai ki te whakaitinga tapeke more e kimihia ana, me te whānuitanga o te āhei ki te whakaiti i ngā putanga mewaro kararehe pāmu ki te mātāpuna.

Mēnā ko te whāinga kia whakaiti i ngā putanga tōpūtanga o te mewaro kararehe pāmu mā te 24–47 ōrau e pā ana ki te taumata o 2017, mā ngā tātai i roto i tēnei kupu tīpoka e whakamahi ai hei whakataurite i ētahi, i te katoa rānei o te whakamahana nō ngā putanga e toe ana.

Ki te whakatō i te āhua 770,000 heketea o te ngāherehere whakatō paina hou mai i tēnei wā, ā, tae atu ki te tau 2050, he āhua ōrite te whakaaweawe paemahana ki te whakaiti i ngā putanga mewaro tōpūtanga mā te 10 ōrau anō. He ōrite tēnei ki te whakatō i ngā heketea 26,000 toharite i ia tau mai ināianei tae noa ki 2050.

Ka taea ēnei nama te whakarahi ake; he 20 ōrau anō ka hiahia i te 1.5 miriona heketea (51,000 heketea i ia tau), he 30 ōrau anō ka hiahia i te 2.3 miriona heketea (77,000 heketea i ia tau), te mea, te mea.

Hei whakamārama i ēnei whika, ināianei e 9 miriona heketea o te whenua e whakamahia ana mō te pāmu tītongi otaota i Aotearoa, ā, ko tōna 1.7 miriona heketea mō te ngāherehere otinga. Ko te pāpātanga whakatō teitei rawa ā-tau mai i te tīmatanga o ngā mauhanga ko te 98,000 heketea i te tau 1998.

He nui ake ngā horahanga o te ngāherehere hou e hiahiatia ana mēnā e whakamahia ai ngā momo rākau taketake nā te mea he iti iho ngā pāpātanga hopu hauhā mō ia heketea i tō te *Pinus radiata* e hohoro ana te tipu. Heoi anō, e pā ana ki ētahi atu momo otaota i runga pāmu, he iti rawa te hautanga o te whakamahana nō te mewaro kararehe pāmu e taea ai te whakataurite ā-motu mā ngā whakatōnga taha awa, ngā kongakonga ngāherehere makatea, ngā rākau whakahaumaruru me ngā uru rākau. Waihoki, e kore e taea te whakatau tata nā te korenga o ngā raraunga mō ngā momo tauwhāiti me ngā whakarōpūtanga pakeke otaota.

He painga anō pea tō te whakatō i ngā horahanga ngāherehere nui rawa hei whakataurite i ngā putanga mewaro kararehe pāmu i ētahi wāhi, engari he pāpātanga kino ā-oaoha, ā-pāpori, ā-ahurea, ā-taiao anō hoki i ētahi atu wāhi. Ka tino hāngai ki te wāhi ngā tukunga iho, ā, ka hāngai hoki ki te tūmomo ngāherehere e whakatōngia ana. Ki te kore e tūpato, tērā te tūraru tūturu ka nui ake ngā pāpātanga o te whakatō ngāherehere i ngā pāpātanga o te whakaiti i ngā putanga tōpūtanga.

Ehara te whakataurite mā te ngāherehere i te whakatikahanga ngāwari hei whakangū i ngā putanga mewaro kararehe pāmu. Me āta whakatūturu kāore i te kino ake te rongoā i te tahomaero.

Me noho hei kawatau matua – hei tāpirihanga ki te whakaheke i ngā putanga tōpūtanga o te hauhā me te hauota-rua ōkai – te whakaiti i ngā putanga o te mewaro ki te whānuitanga e taea ai. Kāore e taea e mātou te whakakore i te raruraru mā te whakatō, waihoki, kāore e taea te whakatō ki te karo i te ngingiha i ngā kora mātātoka.



Ko Allen, M.R., rātou ko Shine, K.P., ko Fuglestedt, J.S., ko Millar, R.J., ko Cain, M., ko Frame, D.J. ko Macey, A.H., 2018. A solution to the misrepresentations of CO₂-equivalent emissions of short-lived climate pollutants under ambitious mitigation. *npj Climate and Atmospheric Science*, 1:16.

Ko Cain, M., rātou ko Lynch, J., ko Allen, M.R., ko Fuglestedt, J.S., ko Frame, D.J. ko Macey, A.H., 2019. Improved calculation of warming-equivalent emissions for short-lived climate pollutants. *npj Climate and Atmospheric Science*, 2(29).

He Pou a Rangi, 2021 Huinga raraunga taiopenga mō te Kupu Āwhina Whakamutunga a te Kōmihana 2021 (he putanga nō te tauira ENZ). <https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/inaia-tonu-nei-a-low-emissions-future-for-aotearoa/modelling/> [I tirohia i te 20 o Ākuhata 2022].

Ko Forster, P., rātou ko Storelvmo, T., ko Armour, K., ko Collins, W., ko Dufresne, J.L., ko Frame, D., ko Lunt, D.J., ko Mauritsen, T., ko Palmer, M.D., ko Watanabe, M., ko Wild, M. ko Zhang, H., 2021. The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity. I roto i: *Climate Change 2021: The Physical Science Basis*. Tāpaetanga o te Rōpū Mahi I ki te Pūrongo Aromatawai Tuarua o te Paewhiri ā-Kāwanatanga mō te Panoni Āhuarangi [Ko Masson-Delmotte, V., rātou ko P. Zhai, ko A. Pirani, ko S. L. Connors, ko C. Péan, ko S. Berger, ko N. Caud, ko Y. Chen, ko L. Goldfarb, ko M. I. Gomis, ko M. Huang, ko K. Leitzell, ko E. Lonnoy, ko J.B.R. Matthews, ko T. K. Maycock, ko T. Waterfield, ko O. Yelekçi, ko R. Yu rāua ko B. Zhou (ngā ētita.)]. Cambridge University Press, Cambridge, UK me New York, NY, USA.

Ko Lynch, J., rātou ko Cain, M., ko Pierrehumbert, R. ko Allen, M., 2020. Demonstrating GWP*: A means of reporting warming-equivalent emissions that captures the contrasting impacts of short- and long-lived climate pollutants. *Environmental Research Letters*, 15(4), 044023.

Manatū Ahu Matua (MPI), 2022. Mō ngā ngāherehere o Aotearoa. <https://www.mpi.govt.nz/forestry/new-zealand-forests-forest-industry/about-new-zealands-forests/> [I tirohia i te 19 o Ākuhata 2022].

Manatū Taiao (MfE), 2022 Ko te Rārangi Haurehu Kati Mahana o Aotearoa 1990–2020. Manatū Taiao: Te Whanganui-a-Tara.

New Zealand Farm Forestry Association, New Zealand Forest Owners Association me Te Uru Rākau New Zealand Forest Service, 2021. National Exotic Forest Description i te 1 o Āperira 2021. Manatū Ahu Matua Te Whanganui-a-Tara.

Ko Reisinger, A. rāua ko Leahy, S., 2019. Scientific aspects of New Zealand's 2050 emission targets. New Zealand Agricultural Greenhouse Gas Research Centre: Papaioea.

Ko Reisinger, A., 2018. The contribution of methane emissions from New Zealand livestock to global warming. Pūrongo ki te Kaitiaki Taiao a Te Whare Pāremata. New Zealand Agricultural Greenhouse Gas Research Centre: Papaioea.

Stats NZ, 2021. Agricultural and horticultural land use. <https://www.stats.govt.nz/indicators/agricultural-and-horticultural-land-use/> [I tirohia i te 8 o Hūrae].

Ka taea tēnei tuhinga te tārua ina whakaatuhia te mātāpuna. E wātea ana tēnei tanga me ētahi atu tanga hoki nā Te Kaitiaki Taiao a Te Whare Pāremata ki pce.parliament.nz.

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