CLAIMS

1. An apparatus comprising at least one processor and at least one memory storing instructions that, when executed by the at least one processor, cause the apparatus at least to:

receive, from an access node, a first message comprising information indicating configured grant uplink resources for performing uplink data transmission to the access node;

receive, from the access node, configuration information for transmitting a dynamic indication, the dynamic indication comprising information indicating which configured grant uplink resources the apparatus will not use; and

transmit, to the access node, the dynamic indication based on the configuration information;

wherein the configuration information comprises information indicating a number of bits to carry the dynamic indication;

transmit, to the access node, a new dynamic indication, wherein the new dynamic indication cannot claim back an unused configured grant uplink resource, for which the apparatus already indicated in the dynamic indication to the access node that the unused configured grant uplink resource will not be used.

2. The apparatus of claim 1, wherein the dynamic indication comprises the indicated number of bits.

3. The apparatus of any preceding claim, wherein each bit of the number of bits to carry the dynamic indication corresponds to a configured grant uplink resource and indicates whether the configured grant uplink resource will not be used by the apparatus.

4. The apparatus of any preceding claim, wherein the information indicating which configured grant uplink resources the apparatus will not use comprises information indicating which of a number of configured grant uplink resources following the dynamic indication the apparatus will not use, wherein the number of configured grant uplink resources corresponds to the number of bits to carry the dynamic indication.

5. The apparatus of any preceding claim, wherein the information indicating which configured grant uplink resources the apparatus will not use comprises a bitmap.

6. The apparatus of any preceding claim, wherein the dynamic indication further comprises information indicating that additional resources are needed for uplink data transmission.

7. The apparatus of any preceding claim, wherein the dynamic indication relates to one configured grant configuration or a plurality of configured grant configurations.

8. The apparatus of any preceding claim, wherein the configuration information comprises information indicating one or more of:

a priority level of the dynamic indication;

a beta-offset for multiplexing the dynamic indication with configured grant physical uplink shared channel;

repetition of the dynamic indication over multiple configured grant physical uplink shared channel resources;

no skipping for the first configured grant physical uplink shared channel resource; or

that a subsequent dynamic indication can overwrite a previous dynamic indication.

9. The apparatus of any preceding claim, wherein the configuration information is received in the first message.

10. The apparatus of claim 9, wherein the first message comprises a configured grant physical uplink shared channel configuration.

11. The apparatus of any preceding claim, wherein the apparatus is further caused to:

obtain information indicating a preferred subset of the configured grant uplink resources, and

transmit, to the access node, uplink data based on the information indicating the configured grant uplink resources and the preferred subset.

12. The apparatus of claim 11, wherein the information indicating the preferred subset comprises information indicating which configured grant resources the apparatus may select when the apparatus requires less than the total number of allocated configured grant resources.

13. The apparatus of claim 11 or 12, wherein the information indicating the preferred subset comprises a bitmap of preferred and non-preferred resources.

14. The apparatus of any of claims 11 to 13, wherein obtaining the information indicating the preferred subset of the configured grant uplink resources comprises receiving, from the access node, the information indicating the preferred subset of the configured grant uplink resources.

15. The apparatus of any preceding claim, wherein the apparatus is further caused to:

determine the number of configured grant resources required for the uplink data transmission; and

determine the dynamic indication based on the determined number of configured grant resources required for the uplink data transmission.

16. The apparatus of any preceding claim, wherein the dynamic indication comprises information indicating which configured grant uplink resources the apparatus will not use in a configured grant cycle.

17. An apparatus comprising at least one processor and at least one memory storing instructions that, when executed by the at least one processor, cause the apparatus at least to:

transmit, to a user equipment, a first message comprising information indicating configured grant uplink resources for the user equipment to perform uplink data transmission to the access node;

transmit, to the user equipment, configuration information for causing the user equipment to transmit a dynamic indication, the dynamic indication comprising information indicating which configured grant uplink resources the user equipment will not use; and

receive, from the user equipment, the dynamic indication based on the configuration information;

wherein the configuration information comprises information indicating a number of bits to carry the dynamic indication;

receive, from the user equipment, a new dynamic indication, wherein the new dynamic indication cannot claim back an unused configured grant uplink resource, for which the user equipment already indicated in the dynamic indication to the apparatus that the unused configured grant uplink resource will not be used.

18. A method comprising, by a user equipment:

receiving, from an access node, a first message comprising information indicating configured grant uplink resources for performing uplink data transmission to the access node;

receiving, from the access node, configuration information for transmitting a dynamic indication, the dynamic indication comprising information indicating which of configured grant uplink resources the user equipment will not use; and

transmitting, to the access node, the dynamic indication based on the configuration information;

wherein the configuration information comprises information indicating a number of bits to carry the dynamic indication;

transmitting, to the access node, a new dynamic indication, wherein the new dynamic indication cannot claim back an unused configured grant uplink resource, for which the user equipment already indicated in the dynamic indication to the access node that the unused configured grant uplink resource will not be used.

19. A method comprising, by an access node:

transmitting, to a user equipment, a first message comprising information indicating configured grant uplink resources for the user equipment to perform uplink data transmission to the access node;

transmitting, to the user equipment, configuration information for causing the user equipment to transmit a dynamic indication, the dynamic indication comprising information indicating which of configured grant uplink resources the user equipment will not use; and

receiving, from the user equipment, the dynamic indication based on the configuration information;

wherein the configuration information comprises information indicating a number of bits to carry the dynamic indication;

receiving, from the user equipment, a new dynamic indication, wherein the new dynamic indication cannot claim back an unused configured grant uplink resource, for which the user equipment already indicated in the dynamic indication to the access node that the unused configured grant uplink resource will not be used.

20. A non-transitory computer readable medium comprising instructions which, when executed by an apparatus, cause the apparatus to perform at least the following:

receiving, from an access node, a first message comprising information indicating configured grant uplink resources for performing uplink data transmission to the access node;

receiving, from the access node, configuration information for transmitting a dynamic indication, the dynamic indication comprising information indicating which of configured grant uplink resources the apparatus will not use; and

transmitting, to the access node, the dynamic indication based on the configuration information;

wherein the configuration information comprises information indicating a number of bits to carry the dynamic indication;

transmitting, to the access node, a new dynamic indication, wherein the new dynamic indication cannot claim back an unused configured grant uplink resource, for which the apparatus already indicated in the dynamic indication to the access node that the unused configured grant uplink resource will not be used.