CLAIMS

What is claimed is:

1. A method of radio resource selection and reporting for a sidelink (SL) communication comprising:

determining, at a transmitting User Equipment (UE), a first set of candidate resources from all resources for the SL communication, wherein the first set of candidate resources are determined based on at least a reference signal received power (RSRP) of the SL communication and a discontinuous reception (DRX) active time of a receiving UE; and

reporting a subset of all the resources to higher layers wherein the subset of all the resources meets a condition, and wherein the subset of all the resources includes at least a portion of the first set of candidate resources.

2. The method in accordance with Claim 1, wherein determining the first set of candidate resources comprises determining the first set of candidate resources by including resources with a RSRP lower than a threshold related to RSRP and having the receiving UE DRX active time.

3. The method in accordance with Claim 2, in a case where the first set of candidate resources does not meet the condition, determining the first set of candidate resources by increasing the threshold related to RSRP and including resources in the first set of candidate resources with a RSRP lower than the increased threshold and having the receiving UE DRX active time corresponding to a timing of the SL communication.

4. The method in accordance with Claim 2 or Claim 3, in a case where the first set of candidate resources does not meet the condition, the first set of candidate resources are determined by including resources with the receiving UE DRX active time.

5. The method in accordance with Claim 1, wherein determining the first set of candidate resources comprises:

determining whether the physical (PHY) layer of the transmitting UE is indicated with a DRX active time of the receiving UE;

in a case where the PHY layer of the transmitting UE is indicated with a DRX active time of the receiving UE, determining selected receiving UE active time resources in response to resource sensing based upon the indicated active time of the receiving UE; and

determining the first set of candidate resources in response to the selected receiving UE active time resources.

6. The method in accordance with Claim 5, wherein determining the selected receiving UE active time resources comprises determining the selected receiving UE active time resources in response to candidate resources within the indicated active time of the receiving UE and within a resource selection window of the transmitting UE.

7. The method in accordance with Claim 1, further comprising:

when the number of resources in the first set of candidate resources is less than a pre-configured percentage of all resources, determining a second set of candidate resources from resources comprising the first set of candidate resources and additional

resources, wherein the additional resources comprise all resources less selected receiving UE active time resources, by:

excluding non-applicable resources in resources comprising the first set of candidate resources and the additional resources, the non-applicable resources comprising resources not applicable for the sidelink communication; and

iteratively performing legacy exclusions to exclude further resources in the additional resources based on an increased threshold related to the RSRP to derive the second set of candidate resources, the second set of candidate resources comprising non-excluded additional resources, and

wherein the subset of all the resources that are reported in the reporting step includes ones of the first set of candidate resources and the second set of candidate resources that meet the condition.

8. The method in accordance with Claim 1, wherein determining the first set of candidate resources further comprises:

when the number of radio resources in the first set of candidate resources is greater than or equal to a pre-configured percentage of all resources, excluding non-applicable resources from all resources to obtain a set of non-excluded resources;

when the set of non-excluded resources is less than the preconfigured percentage of all resources, iteratively performing legacy exclusions to exclude resources in additional resources based on an increased threshold related to the RSRP to derive a second set of candidate resources comprising non-excluded additional resources so long as a number of candidate resources in a set of remaining candidate resources is less than the pre-configured percentage of all candidate resources, wherein

the additional resources comprise all resources less selected receiving UE active time resources and wherein the set of remaining candidate resources comprises non-excluded resources from the first set of candidate resources and the second set of candidate resources; and

when the set of remaining candidate resources is greater than or equal to the pre-configured percentage of all resources, the subset of all the resources that are reported in the reporting step includes ones of the first set of candidate resources that meet the condition and the second set of candidate resources.

9. The method in accordance with Claim 7 or 8, wherein determining the first set of candidate resources further comprises determining the first set of candidate resources from among candidate resources within the indicated active time of the receiving UE and within a resource selection window of the transmitting UE which are below the RSRP and below the increased threshold related to the RSRP.

10. The method in accordance with any of Claims 7 to 9, wherein iteratively performing legacy exclusions comprises iteratively performing legacy exclusions to exclude the resources in the additional resources based on an increased threshold related to the RSRP to derive the second set of candidate resources so long as a number of candidate resources in the set of remaining candidate resources is less than the pre-configured percentage of all candidate resources and a number of iterations is less than a maximum number of iterations.

11. The method in accordance with Claim 10, wherein the maximum number of iterations comprises a pre-configured number of iterations.

12. The method in accordance with any of Claims 7 to 9, wherein iteratively performing legacy exclusions comprises iteratively performing legacy exclusions to exclude the resources in the additional resources based on an increased threshold related to the RSRP to derive the second set of candidate resources comprising non-excluded additional resources so long as a number of candidate resources in a set of remaining candidate resources is less than the pre-configured percentage of all candidate resources and the increased threshold is less than a pre-configured maximum RSRP threshold level.

13. The method in accordance with any of Claims 7 to 9, wherein iteratively performing legacy exclusions comprises iteratively performing legacy exclusions to exclude the resources in the additional resources based on an increased threshold related to the RSRP to derive the second set of candidate resources comprising non-excluded additional resources so long as a number of candidate resources in a set of remaining candidate resources is less than the pre-configured percentage of all candidate resources and a processing time for determining the first set of candidate resources is less than a pre-configured maximum processing time.

14. The method in accordance with Claim 13 wherein the maximum processing time comprises a maximum number selected from the set consisting of a maximum number of seconds, a maximum number of symbols, and a maximum number of slots.

15. The method in accordance with any of the preceding claims, wherein reporting the subset of all the resources to higher layers comprises reporting the subset of all the resources including a ranking corresponding to at least some resources of the subset.

16. The method in accordance with Claim 15, wherein the at least some resources of the subset consists of the pre-configured percentage of the resources in the reported subset of all the resources.

17. The method in accordance with any of the preceding claims, wherein reporting the subset of all the resources to higher layers comprises reporting the subset of all the resources to a media access control (MAC) layer of the transmitting UE.

18. The method in accordance with Claim 17, further comprising selecting one or more resources within the subset of all the resources reported to the MAC layer based on resources which resources are in a set of selected receiving UE active time resources.

19. The method in accordance with Claim 18, in a case when the subset of all the resources reported to the MAC layer do not include any resources that are in the set of selected receiving UE active time resources, further comprising selecting one or more resources within the subset of all the resources reported to the MAC layer that are not in the set of selected receiving UE active time resources.

20. A communication apparatus configured for sidelink (SL) communication, the device comprising:

a transceiver; and

circuitry, wherein the transceiver works in conjunction with the circuitry, which in operation to perform one or more steps in accordance with any one of claims 1 to 19.