WHAT IS CLAIMED IS:

1. A method for reporting a power headroom report (PHR), performed by a terminal, the method comprising:

transmitting cooperatively physical uplink shared channels (PUSCHs) towards multiple transmission reception points (TRPs);

measuring a power headroom (PH) on one or more cooperative TRPs; and

reporting the PHR on the one or more cooperative TRPs according to the PH on the one or more cooperative TRPs;

wherein measuring the PH on the one or more cooperative TRPs comprises:

determining that the terminal does not transmit a PUSCH actually, and measuring a virtual PH of the PUSCH according to a default or predefined reference format corresponding to a single TRP or multiple TRPs as a calculation assumption;

wherein reporting the PHR on the one or more cooperative TRPs according to the PH on the one or more cooperative TRPs comprises：

reporting the PHR comprising the virtual PH corresponding to the PUSCH.

2. The method according to claim 1, wherein reporting the PHR comprises:

determining a PUSCH reference format according to a reference cooperative transmission mode corresponding to transmitting cooperatively the PUSCHs towards the multiple TRPs; and

reporting the PHR comprising the virtual PH corresponding to the PUSCH according to the PUSCH reference format.

3. The method according to claim 1, wherein measuring the PH on the one or more cooperative TRPs further comprises:

determining that the terminal schedules actually a single TRP to transmit a PUSCH, and measuring an actual PH when the PUSCH is transmitted on a designated transmission occasion;

wherein reporting the PHR on the one or more cooperative TRPs according to the PH on the one or more cooperative TRPs further comprises:

reporting the PHR comprising the actual PH.

4. The method according to claim 3, wherein

in response to that a PUSCH for carrying a PHR medium access control - control element (MAC-CE) and the actually scheduled PUSCH are located on a same carrier, the designated transmission occasion comprises:

a first transmission occasion for PUSCH transmissions,

a corresponding earliest transmission occasion for transmitting the scheduled PUSCH in a slot overlapping with the PUSCH for carrying the PHR MAC-CE,

a transmission occasion corresponding to an earliest slot to be transmitted in one or more slots for the scheduled PUSCH where the one or more slots overlaps with multiple slots corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE,

multiple transmission occasions corresponding to multiple slots for the scheduled PUSCH where the multiple slots overlap with multiple slots corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE, or

one or more predefined transmission occasions before a slot for reporting the PHR MAC-CE; and

in response to that the PUSCH for carrying the PHR MAC-CE and the actually scheduled PUSCH are located on different carriers, the designated transmission occasion is determined according to a subcarrier spacing corresponding to an active bandwidth part (BWP) of a carrier for reporting the PHR MAC-CE and a subcarrier spacing corresponding to an active BWP of a carrier where the PUSCH is transmitted.

5. The method according to claim 4, wherein the designated transmission occasion is determined according to the subcarrier spacing corresponding to the active BWP of the carrier for reporting the PHR MAC-CE and the subcarrier spacing corresponding to the active BWP of the carrier where the PUSCH is transmitted, comprises:

in response to the subcarrier spacing corresponding to the active BWP of the carrier for reporting the PHR MAC-CE being smaller than the subcarrier spacing corresponding to the active BWP of the carrier where the PUSCH is transmitted, the designated transmission occasion comprising:

a first transmission occasion for PUSCH transmissions;

an earliest transmission occasion to be transmitted among transmission occasions for the scheduled PUSCH in a slot overlapping with the PUSCH for carrying the PHR MAC-CE;

multiple transmission occasions for the scheduled PUSCH corresponding to a slot

overlapping with the PUSCH for carrying the PHR MAC-CE;

a transmission occasion corresponding to an earliest slot to be transmitted in one or more slots for the scheduled PUSCH where the one or more slots overlaps with multiple slots corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE;

multiple transmission occasions corresponding to multiple slots for the scheduled PUSCH where the multiple slots overlap with multiple slots corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE; or

one or more predefined transmission occasions before a slot of the PUSCH for carrying the PHR MAC-CE.

6. The method according to claim 4, wherein the designated transmission occasion is determined according to the subcarrier spacing corresponding to the active BWP of the carrier for reporting the PHR MAC-CE and the subcarrier spacing corresponding to the active BWP of the carrier where the PUSCH is transmitted, comprises:

in response to the subcarrier spacing corresponding to the active BWP of the carrier for reporting the PHR MAC-CE being equal to the subcarrier spacing corresponding to the active BWP of the carrier where the PUSCH is transmitted, the designated transmission occasion comprising:

a first transmission occasion for PUSCH transmissions;

an earliest transmission occasion among transmission occasions overlapping with a slot for reporting the PHR MAC-CE;

a transmission occasion corresponding to an earliest slot to be transmitted in one or more slots for the scheduled PUSCH where the one or more slots overlaps with multiple slots corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE;

multiple transmission occasions corresponding to multiple slots for the scheduled PUSCH where the multiple slots overlap with multiple slots corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE; or

one or more predefined transmission occasions before a slot for reporting the PHR MAC-CE.

7. The method according to any one of claims 3 to 6, wherein reporting the PHR comprises:

reporting the PHR comprising a single actual PH.

8. The method according to claim 1, wherein measuring the PH on the one or more cooperative TRPs further comprises:

determining to transmit cooperatively the PUSCHs towards the multiple TRPs, and measuring respectively multiple PHs corresponding to designated transmission occasions transmitted towards the multiple TRPs;

wherein reporting the PHR on the one or more cooperative TRPs according to the PH on the one or more cooperative TRPs further comprises:

reporting the PHR comprising a single PH or multiple PHs.

9. The method according to claim 8, wherein in response to that a PUSCH for carrying a PHR MAC-CE and an actually scheduled PUSCH are located on a same carrier, measuring respectively the multiple PHs corresponding to designated transmission occasions transmitted towards the multiple TRPs comprises:

measuring respectively multiple actual PHs after transmitting respectively the PUSCHs on respective first transmission occasions corresponding to the multiple TRPs;

in a slot overlapping with the PUSCH for carrying the PHR MAC-CE, measuring on respective earliest transmission occasions to be transmitted in transmission occasion groups corresponding to different TRPs for scheduling the PUSCHs, to obtain multiple actual PHs;

in a slot overlapping with multiple-slot transmissions corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE, measuring on respective earliest transmission occasions to be transmitted in transmission occasion groups corresponding to different TRPs, to obtain multiple actual PHs;

in a slot overlapping with multiple-slot transmissions corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE, measuring on multiple transmission occasions in respective transmission occasion groups corresponding to different TRPs, to obtain multiple actual PHs;

measuring respectively after transmitting respectively the PUSCHs on respective predefined transmission occasions corresponding to different TRPs before a slot for reporting the PHR MAC-CE corresponding to the multiple TRPs to obtain multiple actual PHs; or

measuring respectively after transmitting respectively the PUSCHs on respective predefined transmission occasions corresponding to different TRPs after a slot for reporting the

PHR MAC-CE corresponding to the multiple TRPs to obtain multiple virtual PHs.

10. The method according to claim 8, wherein measuring respectively the multiple PHs corresponding to the designated transmission occasions transmitted towards multiple TRPs comprises:

in response to that a PUSCH for carrying a PHR MAC-CE and an actually scheduled PUSCH are located on different carriers, measuring an actual PH after the PUSCH is transmitted on a transmission occasion corresponding to a first TRP in and/or before a slot where the PUSCH is transmitted, and measuring an actual PH after the PUSCH is transmitted in a predefined slot corresponding to a second TRP in and/or before a slot where the PUSCH is transmitted;

in response to that a PUSCH for carrying a PHR MAC-CE and an actually scheduled PUSCH are located on different carriers, measuring an actual PH after the PUSCH is transmitted on a transmission occasion corresponding to a first TRP in and/or before a slot where the PUSCH is transmitted, measuring an actual PH after the PUSCH is transmitted in a predefined slot corresponding to a second TRP in and/or before a slot where the PUSCH is transmitted, and using the PH measured for the second TRP before the slot the PUSCH is transmitted as an actual PH after transmitting the PUSCH in a predefined slot after the slot where the PUSCH is transmitted;

in response to that a PUSCH for carrying a PHR MAC-CE and an actually scheduled PUSCH are located on different carriers, measuring an actual PH after the PUSCH is transmitted on a transmission occasion for a first TRP in and/or before a slot where the PUSCH is transmitted, and measuring a virtual PH for a second TRP in a predefined slot after a slot where the PUSCH is transmitted; or measuring an actual PH after the PUSCH is transmitted in a slot for a second TRP where the PUSCH is transmitted, and measuring a virtual PH for a first TRP in a predefined slot after a slot where the PUSCH is transmitted; or

in response to that a PUSCH for carrying a PHR MAC-CE and an actually scheduled PUSCH are located on different carriers, measuring respectively the multiple PHs after the PUSCHs are transmitted respectively on the respective transmission occasions for the multiple TRPs according to a subcarrier spacing corresponding to an active BWP of a carrier for reporting the PHR MAC-CE and a subcarrier spacing corresponding to an active BWP of a carrier where the transmitted PUSCH is located;

wherein the second TRP is one or more other TRPs in the multiple TRPs that are different

from the first TRP.

11. The method according to claim 10, wherein measuring respectively the multiple PHs after the PUSCHs are transmitted respectively on the respective transmission occasions for the multiple TRPs according to the subcarrier spacing corresponding to the active BWP of the carrier for reporting the PHR MAC-CE and the subcarrier spacing corresponding to the active BWP of the carrier where the transmitted PUSCH is located comprises:

in response to the subcarrier spacing corresponding to the active BWP of the carrier for reporting the PHR MAC-CE being smaller than the subcarrier spacing corresponding to the active BWP of the carrier where the PUSCH is transmitted, measuring respectively actual PHs when the PUSCHs are transmitted respectively for the first TRP and the second TRP on respective first transmission occasions among multiple coincident transmission occasions between different carriers, or measuring respectively actual PHs when the PUSCHs are transmitted respectively for the first TRP and the second TRP on multiple coincident transmission occasions between different carriers; or

in response to the subcarrier spacing corresponding to the active BWP of the carrier for reporting the PHR MAC-CE being equal to the subcarrier spacing corresponding to the active BWP of the carrier where the PUSCH is transmitted, measuring respectively multiple actual PHs when the PUSCHs are transmitted respectively for the multiple TRPs on respective first transmission occasions.

12. The method according to claim 8, wherein the single PH in the PHR is one of:

a measured PH corresponding a first TRP by default or by predefined;

a measured PH corresponding to a TRP using a first transmission occasion by default or by predefined;

a measured PH according to a TRP selected by the terminal where a PHR is lower than a PHR threshold;

a PH corresponding to a TRP determined according to positive and negative values, and absolute values of PHs measured for the multiple TRPs;

an actual PH measured corresponding to a TRP actually transmitting the PUSCH when there are actual PHR and virtual PHR in the multiple TRPs at the same time; or

a PH measured according to a TRP configured or indicated by a network.

13. The according to claim 12, wherein the TRP determined according to the positive and negative values, and the absolute values of the PHs measured for the multiple TRPs comprises:

in response to the PHs measured for the multiple TRPs comprises a single negative value, using a TRP corresponding to the single negative value as the TRP of the single PH in the PHR;

in response to the PHs measured for the multiple TRPs being all negative values, using a TRP with a largest PH absolute value as the TRP of the single pH in the PHR; or

in response to the PHs measured for the multiple TRPs being all positive values, using a TRP with a smallest PH absolute value as the TRP of the single pH in the PHR.

14. A method for reporting a power headroom report (PHR), performed by a network device, the method comprising:

configuring a terminal to transmit cooperatively physical uplink shared channels (PUSCHs) towards multiple transmission reception points (TRPs);

configuring the terminal to measure a power headroom (PH) on one or more cooperative TRPs and report the PHR on the one or more cooperative TRPs according to the PH on the one or more cooperative TRPs; and

obtaining the PHR on the one or more cooperative TRPs, reported by the terminal;

wherein configuring the terminal to measure and report the PHR on the one or more cooperative TRPs comprises:

in response to that the terminal does not transmit a PUSCH actually, configuring the terminal to measure a virtual PH of the PUSCH according to a default or predefined reference format corresponding to a single TRP or multiple TRPs as a calculation assumption, and configuring the terminal to report the PHR comprising the virtual PH corresponding to the PUSCH.

15. The method according to claim 14,

wherein configuring the terminal to report the PHR comprising the virtual PH corresponding to the PUSCH comprises:

configuring the terminal to determine a PUSCH reference format according to a reference cooperative transmission mode corresponding to transmitting cooperatively the PUSCHs towards the multiple TRPs; and

configuring the terminal to report the PHR comprising the virtual PH corresponding to the PUSCH according to the PUSCH reference format.

16. The method according to claim 14, wherein configuring the terminal to measure and report the PHR on the one or more cooperative TRPs comprises:

in response to that the terminal schedules actually a single TRP to transmit a PUSCH, configuring the terminal to measure an actual PH when the PUSCH is transmitted on a designated transmission occasion, and report the PHR comprising the actual PH,

in response to that a PUSCH for carrying a PHR medium access control - control element (MAC-CE) and the actually scheduled PUSCH are located on a same carrier, the designated transmission occasion comprises one of:

a first transmission occasion for PUSCH transmissions,

a corresponding earliest transmission occasion for transmitting the scheduled PUSCH in a slot overlapping with the PUSCH for carrying the PHR MAC-CE,

a transmission occasion corresponding to an earliest slot to be transmitted in one or more slots for the scheduled PUSCH where the one or more slots overlaps with multiple slots corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE,

multiple transmission occasions corresponding to multiple slots for the scheduled PUSCH where the multiple slots overlap with multiple slots corresponding to a nominal transmission occasion of a PUSCH configured with repetition type B for carrying the PHR MAC-CE, or

one or more predefined transmission occasions before a slot for reporting the PHR MAC-CE; and

in response to that the PUSCH for carrying the PHR MAC-CE and the actually scheduled PUSCH are located on different carriers, the designated transmission occasion is determined according to a subcarrier spacing corresponding to an active bandwidth part (BWP) of a carrier for reporting the PHR MAC-CE and a subcarrier spacing corresponding to an active BWP of a carrier where the PUSCH is transmitted.

17. The method according to claim 14, wherein configuring the terminal to measure the PH on the one or more cooperative TRPs and report the PHR on the one or more cooperative TRPs according to the PH on the one or more cooperative TRPs comprises:

configuring the terminal to measure respectively multiple PHs of the multiple TRPs on designated transmission occasions, and report the PHR comprising a single PH or multiple PHs.

18. A device for reporting a power headroom report (PHR), comprising:

a processor; and

a memory for storing processor-executable instructions;

wherein the processor is configured to perform the method according to any one of claims 1 to 17.

19. A storage medium wherein instructions are stored in the storage medium, and when the instructions in the storage medium are executed by a processor of a device, the device performs the method according to any one of claims 1 to 17.