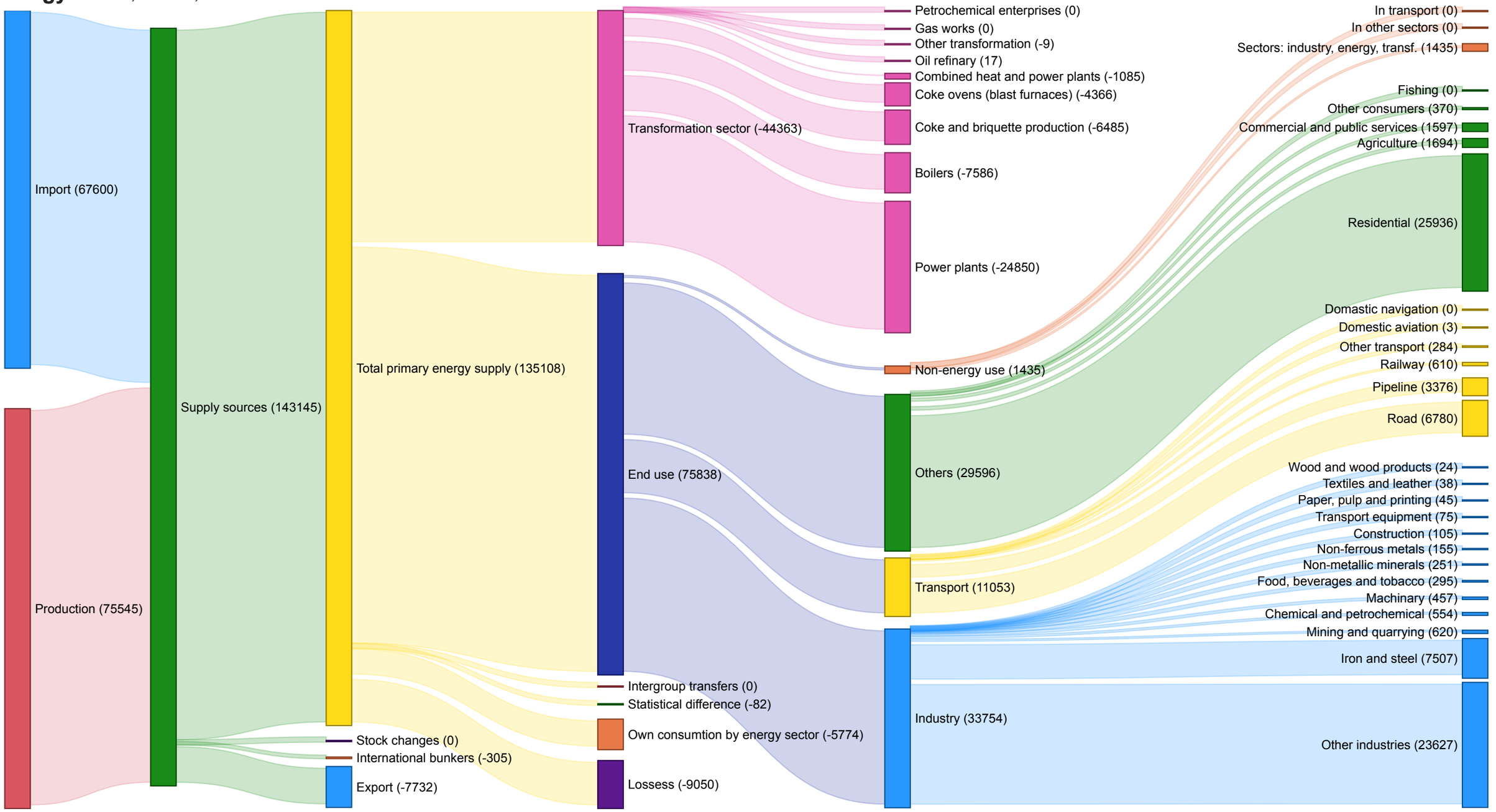Energy flows, th. toe, 1999